

In Twelve Sections.

THE

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BRITISH BIRD BOOK

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200 PLATES IN COLOUR AND
NUMEROUS PHOTOGRAPHS,

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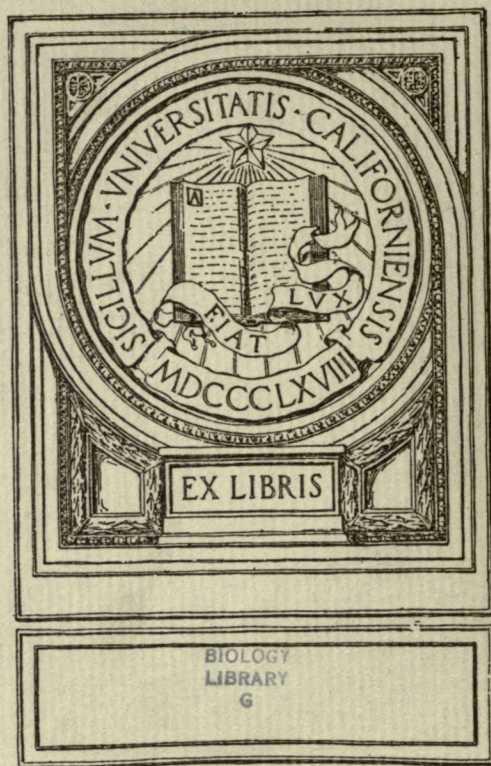
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A COMPLETE WORK ON THE BIRDS, NESTS
AND EGGS OF GREAT BRITAIN

London and Edinburgh ~ T. C. & E. C. JACK



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THE GREBES

[ORDER: *Colymbiformes*. SUBORDER: *Podicipedes*. FAMILY: *Podicipedidae*]

PRELIMINARY CLASSIFIED NOTES

[F. C. R. JOURDAIN. W. P. PYCRAFT. A. L. THOMSON]

GREAT CRESTED-GREBE [*Colymbus cristatus* Linnæus; *Podiceps cristatus* (Linnæus). Tippet-grebe, diver, great-diver; Tommy Allen (Northumberland); loon (Norfolk); gaunt (Lincs.); mulrooken (Ireland). French, *grèbe huppé*; German, *grosser Lappentaucher*; Italian, *svasso maggiore*].

1. Description.—The great crested-grebe may always be distinguished by the broad bands of white which mark the outspread wing; it further differs from all our other native Grebes in its relatively longer beak and greatly superior size. The sexes are alike, and there are striking seasonal changes of coloration. (Pl. 175.) Length 21 in. [533 mm.]. The upper parts are of a dark brown, the under parts white with a peculiar satin-like sheen. In the nuptial dress two tufts, or "ears," of erectile feathers spring from the hinder region of the crown, and the head is surrounded by a large erectile frill, resembling an Elizabethan ruff, of a rich chesnut, shading into dark chesnut-brown at the periphery. The marginal wing-coverts and secondaries are white, as also are the parapteral feathers, so that the outspread wing is marked by large and conspicuous areas of white. The beak is ruddy, the iris crimson, and the legs and toes light olive-green. The "ears" and "ruff" are lost at the autumn moult. The juvenile dress resembles that of the adult in winter, but the head and neck are more or less distinctly striped longitudinally with dark ash-brown. The iris is lemon-yellow. The young in down have the upper parts dark brown and longitudinally striped with dull white. On the crown of the head is a heart-shaped patch of bare, vermilion-coloured skin. [W. P. P.]

2. Distribution.—There has been a very decided increase in the numbers and breeding range of this species of late years, and now it nests on most large sheets

of water in England, with the exception of the Devonian Peninsula, the Lake district,¹ Durham, Northumberland, and Kent, while it has only bred exceptionally in Essex. In Wales it nests in Glamorgan, Brecon, Flint, Montgomery, and Anglesey; and in Scotland, though absent from Tweed, it has bred in Solway and at many localities in Clyde and Forth, north to the Tay area. In Ireland it is found nesting on most of the principal loughs, in some of them plentifully, but avoids those in which the bottom is stony and reeds are absent. On the Continent it is known to nest in Southern Sweden; also in Finland north to Wasa and Kuopio; and in Russia on Lake Onega and the Perm government south to the lower Dneister, the Sea of Azof, and Transcaucasia. From Denmark southward it breeds in suitable localities to the Mediterranean, but it is doubtful whether it does so at the present time in Greece. It nests on some of the Mediterranean islands, Sardinia, Sicily, Cyprus, etc., as well as in North-west Africa (Marocco, Algeria, and probably Tunisia). In Asia it ranges north to the central Tobolsk and southern Tomsk governments, and east to South Ussuria and China, as well as in Japan, while its southward limits include Palestine, Transcaspia, Kashmir, and locally in N. India. It is also said to breed in Abyssinia and South Africa, and is represented by allied races in Australia and New Zealand. Continental birds winter in the Mediterranean region, and Asiatic birds south to the Persian Gulf, India, and Burma. Casual in the Færoes and Norway. [F. C. R. J.]

3. Migration.—Resident within our area so far as known, although a cold-weather visitor to some districts; almost unknown in the most northerly parts of our islands (see above), and everywhere rather local in its distribution, owing to the nature of its haunts. But in winter it is found on the coasts as well as inland. In Yorkshire it is a local resident, and not common as a winter visitor; to Kent it is solely an autumn and winter visitor, seldom seen before November; and in Dumfriesshire it is very locally resident, and an irregular cold-weather visitor (cf. Nelson, *B. of Yorks.*, 1907, p. 738; Ticehurst, *B. of Kent*, 1909, p. 540; and Gladstone, *B. of Dumfries.*, 1910, p. 459). In Ireland it is resident but for a cold-weather movement towards tidal waters and the southern districts (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 376). [A. L. T.]

4. Nest and Eggs.—The nest is a heap of vegetable matter pulled up from the surrounding water, and either floating on the surface or built up in shallow water among the surrounding plants. Rushes, flags, reeds, pondweed, and even dead sticks are used as material, the male assisting in the work and bringing addi-

¹ The first record for Lakeland will be found in the *Zoologist*, 1912, p. 183.



Photo by E. L. Turner

Great crested-grebe's nest with eggs covered



Photo by R. B. Lodge

Eared-grebe's nest and eggs

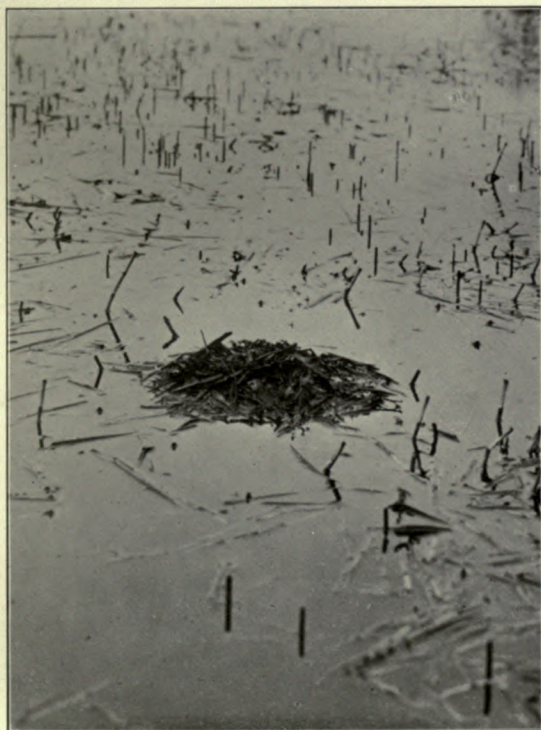


Photo by E. A. Wallis

Little-grebe's nest with eggs covered

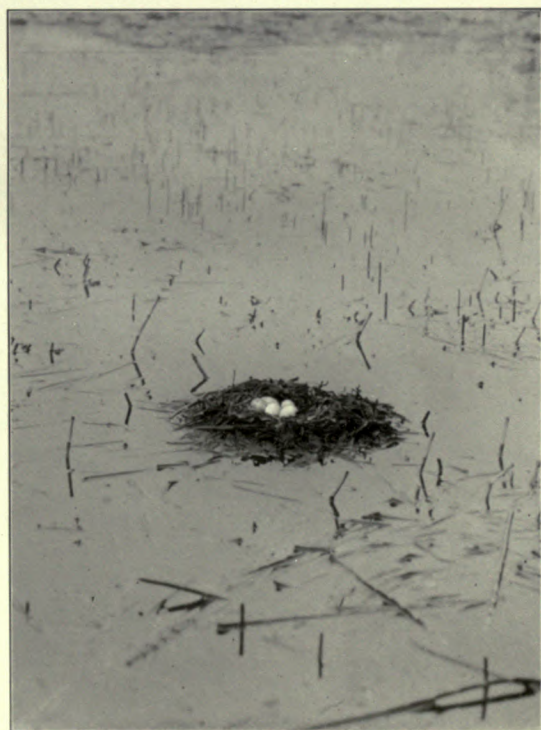


Photo by E. A. Wallis

Little-grebe's nest with eggs uncovered

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tional matter even while his mate is sitting. The hollow in which the eggs lie is barely above water-level, and is generally wet, and the eggs are usually covered with weed when the incubating bird is not on. (Pl. LXXVI.) The eggs are usually 4, less commonly 3 or 5, while exceptionally 6, 7, 8, and even 9 eggs have been found in a nest (*Zoologist*, 1912, p. 427), but it seems improbable that they can have been laid by one female. They have a chalky surface, sometimes deposited in lumps, but when fresh are often a pale bluish or greenish white, though rapidly stained by contact with weeds to some shade of reddish brown or sepia-brown. Very exceptionally black eggs have been recorded. (Pl. W.) Both parents take part in incubation (E. Tristram and W. F. Dewey), and the period is estimated by the latter at four weeks: this is confirmed by Tristram, but Naumann gives it as three weeks only. Average size of 82 eggs, 2.20×1.44 in. [56×36.7 mm.]. The breeding season is variable: some birds have been known to begin laying at the beginning of April, but as a rule it is not till the end of the month or in May that the first clutches are to be found. As this species sometimes, at any rate, rears two broods in the season, it is not surprising that eggs have been met with through June, July, and even in August, while eggs still unhatched have been met with on 1st September. [F. C. R. J.]

5. Food. — Fish, aquatic insects and aquatic vegetation. The young are fed by both parents on small fish. [W. P. P.]

REDNECKED-GREBE [*Colymbus griseigena* Boddaert; *Podiceps griseigena* (Boddaert). French, *grèbe jou-gris*; German, *Rothalsiger-Lappentaucher*; Italian, *svasso collo-rosso*].

1. Description. — The rednecked-grebe in its nuptial dress may at once be distinguished by the white-bordered blue-grey arc at the side of the head; in its winter dress it recalls the great crested-grebe, from which it may at all times be distinguished by having brown instead of white parapteral feathers. The sexes are alike, and there is a striking seasonal change of coloration. (Pl. 176.) Length 18 in. [457 mm.]. Beak black, yellow at the base; iris carmine; feet externally greenish black, internally dull yellowish. The upper parts are of a dark brown washed with grey. The feathers of the crown are elongated, and almost black in colour, while the throat and side of the head are of a blue-grey, with a more or less well-defined white line running along the upper boundary of this area below the eye. The fore-neck and breast are of a rich chesnut, and the under parts are white,

with a satin-like sheen. The inner secondaries and marginal coverts are white, but parapteral feathers are brown. After the autumn moult the sides of the head and neck lose their distinctive coloration and become white. The juvenile dress resembles that of the adult winter dress, but the cheeks and sides of the head and upper part of the neck are more or less plainly marked by blackish streaks. The young in down differs from that of the great crested-grebe chiefly in lacking the vermilion coloured patch on the forehead, and the somewhat more sharply contrasted longitudinal stripes. [W. P. P.]

2. Distribution.—This species is only a winter visitor to our islands, and breeds on the Continent in Southern Sweden, South Finland, and in Russia from the Enare basin, the southern part of the Kola Peninsula, and locally in the Archangel government south to the mouth of the Dneister, the Putrid Sea, and Transcaucasia. It also nests in Denmark, Germany, probably Holland, Austro-Hungary, and the Dobrogea. It is also said to have been found breeding in Morocco, but this appears to require confirmation. In Asia it is widely distributed, ranging north to the Tobolsk and Tomsk governments, and south to the Turgai government and the Oxus delta, but in East Siberia (lower Kolyma, Ussuria, Kamtschatka, etc.) is replaced by a larger race, which is also found in North America from lat. 50° to the Arctic Ocean and Greenland. On migration it ranges south to the Mediterranean and North Africa (Morocco, Algeria, Tunisia, and Egypt), and in Asia to the Caspian Sea, while the eastern form winters in Japan and the United States. In winter the western race visits Norway regularly, and has been recorded once from Spitsbergen and Iceland. [F. C. R. J.]

3. Migration.—A winter visitor, mainly to the eastern seaboard of Great Britain; arrival takes place between 17th August and 20th September, and departure in March (cf. Clarke, *Studies in Bird Migration*, 1912, vol. i. p. 162; and Nelson, *B. of Yorks.*, 1907, p. 740). As far south as Kent it is only a rare occasional visitor, though recorded from September till April (cf. Ticehurst, *B. of Kent*, 1909, p. 542). Although of irregular appearance in the Channel, and rare on the west of Great Britain generally, it is apparently not infrequent off Cornwall (cf. Saunders, *Ill. Man. British Birds*, 2nd ed., 1899, p. 719). There are very few Irish records, all for December, January, or February (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 379). Great influxes are occasionally observed, "as in 1865 and again in 1897 in Norfolk, in January 1891 in Yorkshire, and on the coast of East Lothian in the early part of 1895" (Saunders, *loc. cit.*). It very rarely visits our inland waters. [A. L. T.]

4. **Nest and Eggs.**—Does not breed in the British Isles. [F. C. R. J.]

5. **Food.**—Aquatic insects and their larvæ, Crustacea, small fish, tadpoles, and aquatic vegetation. [W. P. P.]

SLAVONIAN-GREBE [*Colymbus auritus* Linnæus; *Podiceps auritus* (Linnæus). Horned-grebe (Devon). French, *grèbe cornu*; German, *gehörnter Lappentaucher*; Italian, *svasso forestiero*].

1. **Description.**—Apart from considerations of size, the Slavonian is distinguished from the rednecked-grebe in having the marginal coverts of the wing brown, and from the eared-grebe in having the three outer secondaries ash-coloured, the rest white. The sexes are alike, and there is a striking seasonal change of coloration. (Pl. 176.) Length $13\frac{1}{2}$ in. [342 mm.]. The upper parts are of a very dark brown, the head and throat are black, the feathers of the latter region and the hinder region of the head being conspicuously elongated, and form a velvety black “ruff,” which is completed by elongated tufts arising on each side of the head above the eye, and extending backwards to form a pair of heavy, rich chesnut-coloured tufts. The fore-neck and flanks are also chesnut, but redder than the tufts. The under parts are of a satin-like white, with dusky markings on the abdomen. The beak is black with a touch of bluish grey and rose at the base, and bluish grey at the tip. Iris carmine, but the pupil surrounded by a white ring. After the autumn moult the ornamental plumes are wanting, the top of the head and hind-neck being then of a greyish black, the throat and fore-neck white, save in the area which is red in summer: this is now of a dusky hue. The flanks are of a dark ash colour. The rest of the under parts are white with a satin-like sheen. The juvenile dress resembles the adult in winter, but has the back of the head and neck of a sooty brown, and more or less distinct longitudinal streaks of sooty brown, on the sides of the head. The downy young have the upper parts dark brown striped longitudinally with white. These markings are most conspicuous on the neck, and are said to fade rapidly from the back. [W. P. P.]

2. **Distribution.**—In the British Isles this species is only known with certainty to breed on one loch in Inverness-shire, though previously suspected of having nested in the Outer Hebrides and on the west coast of Scotland. Outside the British Isles it breeds plentifully in Iceland, and on the Continent in Norway, and in Sweden only in Jemtland, Gotland, and Öland; in Finland more commonly in the north than in the south, and in Russia up to about $65\frac{1}{2}^{\circ}$. Southward it breeds

sparingly in Denmark, and in Russia to the Novgorod, Moscow, and Kazan governments, the Baltic Provinces, Astrakhan, and Orenburg. In Asia it is found in the Tobolsk and Tomsk governments, and on the Lena up to about 64° , as well as the lower Amur, and also in the Altai range and Dauria. In North America its breeding-grounds extend over practically all the Dominion of Canada and Alaska. On migration European birds range south to the Mediterranean and the Azores: the Færoes are visited on passage only; while Asiatic birds range south to about lat. 24° and China; and in America South California, the Gulf coast, and Florida are visited. [F. C. R. J.]

3. Migration.—A resident in that a few breed in the north of the Scottish mainland and possibly in other localities: otherwise mainly a cold-weather visitor to the coasts of the British Isles, occasionally recorded from inland waters (cf. Hartert, Jourdain, Witherby, and Ticehurst, *Hand-List of British Birds*, 1912, p. 157). As a winter visitor it arrives between 27th August and 9th September, but sometimes up till October, while passage movements occur between 9th September and 28th November, and between 5th May and 18th June (cf. Clarke, *Studies in Bird Migration*, 1912, vol. i. pp. 162, 140). As an autumn and winter visitor it occurs regularly on most parts of the Scottish coasts, and is common both in the northern and in the western isles (cf. Saunders, *Ill. Man. British Birds*, 2nd ed., 1899, p. 721). In England it is best known on the eastern seaboard, especially in Norfolk, but also in the Humber region, where it has been recorded in August and is frequently met with from September or October to March: on the south and west it is of more irregular occurrence, although met with annually on the coast of Wales and by no means rare as a casual in the Scilly Isles; there are also records from Oxfordshire and other inland districts (cf. Saunders, *loc. cit.*; Nelson, *B. of Yorks.*, 1907, p. 743; Forrest, *Fauna of N. Wales*, 1907, p. 409; Clark and Rodd, *Zoologist*, 1906, p. 345; and Aplin, *Zoologist*, 1899, p. 441, and 1907, p. 331). It is of frequent occurrence on the north and north-west coasts of Ireland, especially in certain favoured bays, but is rare in the south; it is met with, mainly singly or in pairs, from September to June, but especially in February; adults are comparatively often obtained on the spring passage (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 379; and Saunders, *loc. cit.*). [A. L. T.]

4. Nest and Eggs.—The nesting-site does not differ materially from that of other grebes. Where sheltering vegetation is available it is placed among rushes and water-plants, and consists of a heap of dead water-weeds, as a rule, though in more southern localities bits of reed and in fact any vegetable matter is used.

On barren lakes it has been found in Iceland on a stone in the water and in a grass tussock. Both sexes share in the work of building (Hantzsch), and the nests are exceedingly variable in size. The eggs are normally 4 in number, sometimes 5, and occasionally 6 or only 3. When quite fresh they are white with a greenish tinge, but soon become buff or yellowish brown by contact with the nest, and after incubation are frequently deeply stained. (Pl. W.) Average size of 40 eggs, 1.75×1.21 in. [44.5×30.9 mm.]. Most of the incubation is performed by the female, the male generally swimming close at hand, and only exceptionally brooding for a short time, and the period is estimated at 20 to 24 days (Hantzsch). In Iceland the first eggs are laid at the beginning of June; but though eggs may be found till the end of July, it is very improbable that more than one brood is reared in the season. [F. C. R. J.]

5. Food.—Aquatic insects and their larvæ, Crustacea, small fish, Confervæ, and other aquatic vegetation. The young are fed by both parents on a similar variable diet. [W. P. P.]

BLACKNECKED-GREBE or **EARED-GREBE** [*Colymbus nigricollis* (Brehm); *Podiceps nigricollis* (Brehm). French, *grèbe oreillard*; German, *Schwarzhalsiger-Lappentaucher*; Italian, *svasso piccolo*].

1. Description.—The eared-grebe may readily be distinguished by the fact that the secondaries and the greater part of the innermost primaries are white, while the tip of the beak is slightly recurved. The sexes are alike, and there is a marked seasonal change of coloration. (Pl. 176.) Length 12 in. [305 mm.]. In the nuptial dress the head and neck, and the back and wings, save certain of the remiges, are black. The superciliary feathers and ear-coverts are much elongated, and form a tuft of hair-like texture, straw-coloured above, and shading into chesnut on the ear-coverts. The flanks are chesnut, and the rest of the under parts glistening white. The iris is crimson, but a narrow ring of white surrounds the pupil. The beak is slate-blue, reddish at the base, and the legs and toes leaden blue, save their outer surfaces, which are black. After the autumn moult the auricular plumes are wanting, the throat and sides of the head become white, like the breast, while the ear-coverts and fore-neck become brownish white, and the flanks slate-coloured. The juvenile dress is like that of the adult in winter, but the side and head are more or less obscurely marked by longitudinal striations, and the iris is yellow. The nestling has the upper parts dull black, marked with numerous longitudinal greyish white stripes. [W. P. P.]

2. Distribution.—This species, like the Slavonian, is only known with certainty to breed at one locality in the British Isles, which has not been made public. There is, however, tolerably conclusive evidence that it bred once at least in Norfolk (E. T. Booth), possibly also in Perth and Oxford. On the Continent there is no evidence of breeding in Scandinavia, but it nests sparingly in Denmark (Thisted) and possibly in S. Finland; is rare in the Baltic provinces, but breeds commonly in the Moscow, Tula, Simbirsk, Kazan, Ufa, and Orenburg governments, south to the Crimea and Transcaucasia. Over the rest of the Continent south to the Mediterranean it is found locally, and also breeds in Africa not only in the north, but also in Abyssinia and in S. Africa to Cape Colony. In Asia its distribution is imperfectly known, but it nests in the Tomsk government to lat. 52°, and is found in the Kirghis steppes and Asia Minor, probably also in Cyprus, while it may possibly range east to Ussuria. In North America it is replaced by an allied race which chiefly inhabits the western side of N. America, breeding in British Columbia, Alberta, Manitoba, etc. On migration European birds range to the Mediterranean region: casual in Azores and Madeira. Asiatic birds reach Arabia, Persia, India (rarely), China, Japan, etc., and the American race visits Central America. [F. C. R. J.]

3. Migration.—This grebe has been described as “chiefly a southern bird which at intervals pushes its migrations in spring and summer as far to the north-west as the British Isles” (Saunders, *Ill. Man. British Birds*, 2nd ed., 1899, p. 723). It occurs more rarely in autumn and winter, and it has also been recorded as breeding regularly in one locality, and exceptionally, but perhaps doubtfully, in some others (see above). The date of its arrival as a winter visitor has been given as from 25th July to September or November (cf. Clarke, *Studies in Bird Migration*, 1912, vol. i. p. 162). The coast of Merioneth is regularly visited in February and March, and the seaboard of Norfolk and Yorkshire are also specially favoured: it very rarely occurs in the north-west of England or in any part of Scotland; and although there are records from the Inner Hebrides and the Orkneys, there are none from the Outer Hebrides or the Shetland group (cf. Saunders, *loc. cit.*; Witherby and Ticehurst, *British Birds*, vol. ii. p. 421; Hartert, Jourdain, Ticehurst, and Witherby, *Hand-List of British Birds*, 1912, p. 158; and Nelson, *B. of Yorks.*, 1907, p. 744). To Ireland it is a “rare and accidental” winter visitor, but there are also two records for the month of June (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 380). [A. L. T.]

4. Nest and Eggs.—This species shows a great tendency to breed in colonies, and is much more sociable in the breeding season than the other grebes.

The nest is the usual heap of water-weeds, only rising an inch or two above the water surface, and in some cases as many as thirty to forty pairs may be found breeding together, the nests being sometimes not more than a yard apart. Probably both sexes share in the work of building, but definite records seem to be wanting. The eggs are normally 4 in number, sometimes only 3, and occasionally 5 or 6. In appearance they resemble the other grebes' eggs, being bluish white when first laid, which rapidly changes to ochreous or yellowish brown, the chalky surface absorbing staining matter from the weeds. In size they are slightly larger than those of the dabchick and smaller than those of the rednecked-grebe, but are not distinguishable from those of the Slavonian, though slightly more elongated as a rule. (Pl. W.) Average size of 34 eggs, 1.7×1.18 in. [43.3×30 mm.]. Incubation is performed by both sexes in turn according to Naumann, and is stated by the same writer to last for three weeks. The first eggs may be found in Germany in the last days of April, but more commonly in early May. Although eggs may be found throughout June, and according to Naumann even in July and August, it is not proved that breeding takes place more than once in the season. In Spain full clutches may be found at the end of April. [F. C. R. J.]

5. Food.—Aquatic insects and their larvæ, tadpoles, small fish, and weeds. The young are fed by both parents on small fish and larvæ. [W. P. P.]

DABCHICK or LITTLE-GREBE [*Colymbus ruficollis* Pallas; *Podiceps fluviatilis* (Tunstall). Dowker; di-dapper (Hants); footinarse (Lancashire); dobchicken (Suffolk). French, *castagneux*; German, *kleiner Lappentaucher*; Italian, *tuffetto*].

1. Description.—The dabchick is by far the smallest of our native grebes, and may further be distinguished by the absence of white on the secondaries, save only the inner webs, where it is concealed. The sexes are alike, and there is a marked seasonal change of coloration. (Pl. 176.) Length $8\frac{1}{2}$ in. [215 mm.]. In its nuptial dress the upper parts are of a sooty black with a greenish gloss. The fore-neck is of a deep chesnut, and this coloration extends forward to embrace the under surface of the head to the level of the auriculars, and forming a strong contrast with the black of the rest of the head and hind-neck. The breast and flanks are blackish, with a silvery sheen on the breast. The beak is black, yellow at the tip and gape; the legs and toes are olive-green, and the iris is hazel. After the autumn moult the upper parts appear dark brown, the cheeks and throat white,

and the fore-neck reddish brown, the flanks brownish buff, the breast white. The juvenile dress resembles that of the adult in winter, but the sides of the head are more or less conspicuously marked with longitudinal dusky stripes. The downy nestling, at first black, has the upper parts black with longitudinal stripes of pale rufous; later the black areas become brown, and the rufous stripes become white. [W. P. P.]

2. Distribution.—In the British Isles this species is very widely distributed on most slow-flowing streams, lakes, and ponds, and though less common in the north of Scotland, is found up to Sutherland and Caithness, as well as on the Outer Hebrides and Orkneys, and possibly also breeds in the Shetlands. It is common and generally distributed in Ireland, and is also found in the Isle of Man. Outside the British Isles it is local in Russia, but nests in S. Livonia, the Petersburg and Smolensk governments, Lithuania, and Poland, the Kieff, Kharkov, and Astrakhan governments, and is resident in the Crimea and Transcaucasia (Buturlin). Over the rest of the Continent south of the Baltic it is fairly general south to the Mediterranean and most of its islands (Sardinia, Sicily, Cyprus, etc.), and is resident in the south of this district as well as in N. Africa from Morocco east to Egypt. In Asia it breeds in the Central Urals, but Buturlin states that it is replaced by an allied race in Turkestan and Transcaspia, which apparently also breeds from the Euphrates valley to India, Ceylon, Burma, Yunnan, etc., while other forms also replace it in tropical and South Africa, the Malay Archipelago, Australia, New Zealand, and N. America. On migration it has occurred in Southern Scandinavia and the Færoes. [F. C. R. J.]

3. Migration.—Our own birds are resident and probably non-migratory, except in so far as the freezing of inland haunts compels them to seek the coasts in winter. It also comes to us in small numbers from farther north in the cold season, and in Yorkshire it is described as both a resident and a winter visitor, arriving from September to November; but in Kent there is no evidence of migration (cf. Clarke, *Studies in Bird Migration*, 1912, i. p. 55; Nelson, *B. of Yorks.*, 1907, p. 747; and Ticehurst, *B. of Kent*, 1909, p. 546). Frequently obtained at the light-stations on the coasts of Great Britain and Ireland. [A. L. T.]

4. Nest and Eggs.—The nest is similar in character to those of the other grebes, being a heap of fermenting water-weeds and decaying vegetable matter, with a hollow in the middle almost level with the water. It is generally placed among rushes or water-plants, but sometimes quite in the open or sheltered by branches of trees overhanging the water. (Pl. LXXVI.) Both sexes take part in

the work of building, and the male will bring additional matter after incubation has begun. The eggs vary as a rule from 4 to 6 in number, exceptionally 7, and are the smallest of the European grebes' eggs. Though bluish white when quite fresh, they become rapidly stained, and may be found bright red where there is much ferrous oxide in suspension in the water, or deep red-brown in peat-bogs. (Pl. W.) Average size of 72 eggs, 1.48×1.02 in. [37.8×26.1 mm.]. Both sexes share in incubation, and the period is estimated at 18 to 20 days (Oswin Lee), 20 to 21 days (Naumann). Apparently incubation begins with the first egg, or else the heat of the nest causes the eggs to develop, for the young are not hatched simultaneously. Eggs have occasionally been found in March, but the more usual time is April, and as eggs have been met with from May to September, it is almost certain that more than one brood is reared during the season. Probably normally the first clutch is laid in April and the second in June. [F. C. R. J.]

5. Food.—Aquatic insects and their larvæ, small fish, tadpoles, and water-weeds. The young are fed by both parents. [W. P. P.]

THE GREBES

[W. P. PYCRAFT]

By common consent the Grebes and Divers are now regarded as nearly related, very ancient types displaying a quite remarkable degree of adaptation in their environment. And this is nowhere so strikingly manifest as in the skeleton, though in this respect they also display some striking differences. But we are concerned here rather with the external characters and the habits of these two types.

Both Grebes and Divers are carnivorous, and mainly piscivorous, pursuing their prey under water after the fashion of the Alcidæ, the Diving Ducks, and the Penguins, and hence the common resemblances of structure which these several types present. A careful study of the skeletons of these diverse types affords one of the most instructive object-lessons on "adaptation to environment" to be found in the whole animal kingdom. But considerations of space make such a survey impossible in these pages. It must suffice to remark that the Grebes and Divers on the one hand, and the Penguins on the other, mark the extremes of specialisation in the direction of sub-aqueous locomotion among birds. In so far as the Grebes and Divers are concerned, it is interesting to note that while they possess, as might be supposed, much in common, they reveal also some curiously contradictory features. Thus, for example, in the Divers the sternum is extremely long, in the Grebes it is short and wide. Both agree in having a remarkably elongated and narrow pelvis, comparable only, strangely enough, to certain flightless members of the ostrich tribe, such as the Apteryx. Both agree in having the knee-joint prolonged upwards beyond the end of the femur, but while in the Divers this upstanding spur is formed by the cnemial crest of the tibia or "shank" bone, in the Grebes it is formed, mainly, at any rate, by the knee-cap,

as in the extinct giant Diver *Hesperornis*. Then the Divers are web-footed, the Grebes lobe-footed, like the Coots, and "fin-feet" and the Phalaropes. Progress on land, both in the case of Grebes and Divers, is difficult. But the Grebes can at least walk; the Divers have lost this power, and make their way on land only by shuffling along on the breast aided by the wings. The feet, both of Grebes and Divers, are remarkable for the extraordinary degree of lateral compression which they display, causing the toes when coming forward to the stroke in swimming to lie one behind the other. Thus the least possible resistance to the water is given. But why the whole plantar surface of the foot of the Grebes should be provided with a double row of short, conical spikes, while in the Divers it forms a "knife-edge," no one has been able to suggest.

The Divers have a well-defined tail of short, stiff feathers; the Grebes are, to all intents and purposes, tailless, for in spite of statements to the contrary, the tail feathers of these birds can only be discovered after careful search, and are never more than degenerate semiplumous structures, scarcely, if at all, exceeding the general feathering of the body in length.

As touching coloration, the Grebes are, perhaps, the more resplendent, while in the matter of the coloration of the nestling they are more primitive than the Divers, for the young Grebe is striped, young Divers are whole-coloured. Not the least striking feature of the adults is the peculiar satin-like sheen of the white breast feathers, which is possessed by few other birds. These feathers a few years ago unhappily caught the eye of the milliners; as a result there was an enormous demand for Grebes' breasts, entailing an appalling slaughter of birds, such as would speedily have put an end to the species had not the tide of feminine taste happily turned.

GREAT CRESTED-GREBE

[W. P. PYCRAFT]

The great crested-grebe is the largest and handsomest of our native Grebes, and the one which has been most carefully studied. Yet there is one fact in regard to its life-history that would never have been discovered by the closest study of its habits in these islands. And this concerns its response to climatic influences. Few birds have such an extended breeding range, remarks Seeböhm, as the great crested-grebe. Without entering into details, it will suffice to say that it occurs throughout the whole of the Old World, excepting only the more northerly regions and the lowlands of the tropics. In Africa, for example, it occurs not only in isolated regions, and at relatively high altitudes, but also in Marocco, where it breeds in huge colonies; while it thrives no less readily as far north as Finland. Our native birds, from early spring to late autumn, distribute themselves over the greater part of England, Wales, and Ireland, contriving to find a comfortable livelihood wherever there is a sufficiency of open water and reeds to assure their food and concealment. Large ponds and lakes are alike favoured by them. But during the actual winter months they forsake these haunts for the sea, even in districts like the Norfolk Broads, which are all within a few miles of their haven.

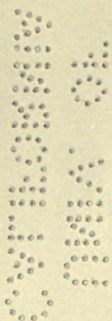
The migration to the sea takes place during November, and this journey is preceded by the formation of flocks during October. Early in February they return in bands to their inland haunts, and for a while herd together. But by the end of this month they begin to pair up. By the beginning of April nest-building has begun. May witnesses the appearance of the young, and from this time to the flocking in October these birds are generally supposed to live in family

Plate 175

Great crested-grebe and young in down

By A. W. Seaby





parties. So far as my own observations go this is not strictly correct, but to this matter I propose to return in due course.

More than one writer has described the great crested-grebe as a gregarious bird. This is not an accurate description, as will be gathered from the foregoing remarks. But since there is an abundance of food for all, and no lack of breeding-sites, the struggle for "territory," first demonstrated by Mr. H. Eliot Howard, is less intense, and hence many pairs can occupy a comparatively small area without endangering the welfare of the community. It is partly on this account, and also partly on account of the fact that they feed by day, that the great crested-grebe, if due precautions are observed, is so easily kept under observation; but they are very wary, diving at once if their suspicions are aroused, and making for the shelter of the reeds. Flight is a mode of motion rarely indulged in, but they will often make short journeys on the wing at dusk, sometimes rising twenty or thirty feet above the water, but they rarely travel more than a few hundred yards. During such excursions they resemble ducks, the neck being held straight out, and the feet projecting far behind do duty for a tail. The wing beat is not unlike that of a duck, and they strike the water on alighting in similar fashion. In swimming they float low, and can, at will, sink the body till the water is level with the back, apparently by emptying the air-sacs. They dive elegantly, as it were gliding under the water, head first, wherein they contrast with the more vigorous lunge given by the cormorant, which, in some places, as on one of the Norfolk Broads a generation ago, shared the same haunts.

Progress under water is made with extreme agility, but with the feet only. At times they will move along just below the surface, so that their course can be followed by the ripple; but more commonly the object of their pursuit takes them much deeper.

For the most part they seem to live on small fish, which demand considerable speed and skill for their capture; but aquatic insects, and a certain amount of vegetable matter, are also eaten.

One peculiarity the great crested-grebe shares with its congeners, and this is the use of feathers instead of grit or stones for digestive purposes—that is to say, in the comminution of its food. I have never dissected a grebe whose stomach did not contain feathers, always those of the breast. Why they should display this singular habit is beyond hope of discovery, and it is not the less puzzling because no birds, other than the Grebe tribe, are known to adopt this strange habit of feather eating, save in the case of captive birds, wherein it represents a disorganised condition of health, as in the case of parrots, for example. It would seem that the feathers are not disgorged in the shape of pellets, as in the case of owls and hawks, which swallow a certain percentage of the feathers of their victims, but that they are slowly digested. But then the bolus thrown up by the raptorial birds has formed in the crop; that which is so commonly met with in the Grebes is always found in the stomach, whence rejection is impossible. I have never taken stones or grit from the gizzards of grebes.

Has the coloration of the great crested-grebe been in any way determined or controlled by its habits? It is true this question is applicable to all birds, but it is especially apt in the present species, because it is a species which can readily be kept under observation, and several individuals can be studied and compared at the same time; and it also presents two distinct aspects of coloration—the one, which may be called its environmental coloration, which embraces the whole aspect of the bird at all times of the year, the other its nuptial coloration. This last, while emphatically ornamental, is yet not so vivid in its hues as to be conspicuous save at short range. It may therefore be ignored when considering the character of the plumage as a whole.

I paid particular attention to this subject some two years ago, when I enjoyed exceptional opportunities for studying these birds on one of the Norfolk Broads. This was during the month of August, when adults and half-grown young could be watched side by side. I had these

birds under observation daily from dawn till dusk, and I left with the conviction that their coloration must be regarded as "concealing" or "obliterative," at any rate when all the factors of the environment were taken into consideration. For, undoubtedly, in open water there was no difficulty in seeing them even in the distance, but when near a background of reeds they were extremely difficult to detect. But one cannot measure the protective value of this coloration by existing conditions, for these sheets of water are now kept open only by human intervention, by constantly cutting down and rooting up the reeds and floating vegetation. Under natural conditions there would be no large areas of clean water. This admitted, we have next to try and reconstruct the conditions of existence in the remote past, when this livery was evolved. What were the factors of elimination before the advent of man on the scene to disturb the balance of nature? These we can only dimly realise. But their enemies must have been chiefly raptorial birds, and possibly otters and pike. The silvery breasts probably served as screens from sub-aqueous foes, and the dark brown upper surface performed a like office against harriers, which at that time must have swarmed, and therefore, owing to the keen struggle for existence, have been compelled to depend in part, at any rate, on the grebes for their maintenance. The weak point of this interpretation lies in the fact that the coot, which even to-day lives side by side with the grebe, displays a totally different kind of coloration. If it be argued that coots are more numerous than grebes, it must be admitted that the relative values of these liveries cannot have been greatly different, or the grebes would have been exterminated before man came to the rescue, unintentionally, by eliminating the harriers.

Here then, any way, is a problem awaiting solution, and it may be solved by a closer, more systematic study of the habits of the great crested-grebe to-day. But in attacking this riddle it must not be forgotten that this bird displays a seasonal change of plumage. That the nuptial dress is the latest acquired there can be no doubt. The

ornaments which distinguish this are probably related to the elaboration of the secretions of the sexual glands, as we have already suggested, but their character may well have been controlled by the needs of the environment. In the end it may be decided that the whole coloration, throughout the year, is but the expression of idiosyncrasies of growth which have not come directly under the shears of selection, simply because variation did not tend in the direction of undue conspicuousness.

And now we must turn to the strictly ornamental part of the plumage, which, as we have already mentioned, is furnished by the paired tufts of elongated feathers known as the "ears," which are erectile and capable of a considerable range of movement, and a frill of feathers, also erectile, surrounding the head like an Elizabethan ruff. The white of the fore-part of the face, contrasting with the bright chesnut and dark brown hues of the ruff, makes this last a most conspicuous ornament during the displays to be described presently. These highly decorative plumes are purely ornamental, being discarded at the autumn moult. What factors have produced them? At present this question is unanswerable. That they are intimately associated with the secretions of the sexual glands seems certain. But the fact that no other grebe is adorned in like fashion seems to point to some idiosyncrasy of growth, some temperamental peculiarity. This much may be gathered from their display during what is known as the "courtship" period. But while we now have a fairly complete account of this, we know little or nothing of what obtains under the same circumstances among other grebes, and until these gaps in our knowledge are filled up, much that is recorded of the present species must remain enigmatical.

As touching the "courtship," much valuable information has been gathered by Mr. Edmund Selous, but besides his observations I am indebted to some extraordinarily interesting notes by my friend Mr. Leonard Huxley. But as these are in the course of publication, I cannot make full use of the facts he has so generously placed at my disposal.

Mr. Huxley lays special stress on the fact that, unlike most birds, the period of sexual excitement is manifested by displays in which both sexes take an equal share. The display of the one is almost the mirror image of that of the other. This equality in performance is surely connected with the fact that both sexes assume a precisely similar nuptial dress: though extravagance in the matter of antics during this period of sexual excitement is by no means confined to birds of resplendent plumage, when the sexes are soberly coloured the female is rarely more than a passive witness of the performance of her prospective mate.

Not the least curious feature of the displays now to be described is the fact that, so far as the evidence goes, they take place only after pairing up has taken place. But to this we shall return: for the moment we are concerned only with the actual performance, which is of a truly remarkable character. It begins when the two birds, which perhaps have been feeding, suddenly approach one another, at the same time raising the ear-tufts and ruff and extending the neck vertically. Presently they are face to face, and then each begins to shake the head vigorously at the other, some four or five times from side to side in quick succession. Then the same movement is repeated very slowly; a moment or two later the vigorous shakings begin again. After a few repetitions of these quaint actions, the birds move off to feed as if nothing at all had taken place. Sometimes, however, before parting, and between the head shakings, one after the other would go very slowly through a sort of preening pantomime: thrusting the beak down into the back feathers, but yet without actually preening. Once or twice Mr. Huxley was so fortunate as to see a solitary hen apparently on the look-out for her mate, and evidently in a state of suppressed excitement, for she swam along with her head and neck stretched straight out, so that the ruff swept the water. Meanwhile she kept swinging her neck from side to side and uttering a short barking call, some five or six times. Then she raised her head as if to seek the more readily for her missing mate; and a moment later resumed the

horizontal pose and the calling. These alternate movements were several times repeated. At last the male saw her, erected his neck vertically as if to take a good look at her, then dived. At once she changed her whole demeanour, half raising her wings, drawing her head back, erected both "ears" and ruff. In this position the white of the base of the neck and of the marginal coverts and secondaries showed conspicuously. And in this attitude she awaited his appearance from the depths, swinging excitedly from side to side. Suddenly he appeared, and, as Mr. Huxley remarks after a most amazing fashion, "he seemed to grow" out of the water. First appeared his head, with ears and ruff extended, and beak pointing downwards, then his neck, and finally the body, till only the extreme tail-end remained in the water, so that he looked rather like a penguin than a grebe! All the while the bird was turning, so to speak, on his long axis till he gradually faced his mate. A moment later both had subsided into normal attitude, but at once commenced to shake their heads at one another. Speedily, however, they drifted apart, and commenced to feed as if nothing had happened.

But these strange antics are only the preliminaries to still stranger. For later a pair of birds, occasionally engaging in preening themselves and fishing, suddenly approach one another and begin head-shaking, raising the wings, and revolving as we have already described, each as it were striving to outdo the other. Then the ears, till now erect, were thrust out laterally, and the ruff was still further erected, till ears and ruff formed a common disc. Then the hen dived, a moment later the cock followed. A quarter of a minute later she appeared again, and a second or two later she was followed by the male, who reappeared some five-and-twenty yards off. Each was crouching low over the water, and each bore in its beak a tuft of weed. So soon as they sighted one another, each made for the other at a great pace. When about a yard apart both sprang up out of the water till they assumed the penguin position, save that the beak was not depressed, but maintained a horizontal position, holding

the weed. Still approaching, the birds eventually touched each other with their breasts, and now, each as it were supporting the other, by rapidly treading the water they swayed their bodies from side to side in a sort of ecstasy, and all the while shaking their heads at one another. Then they gradually settled down into the normal swimming pose, but still kept up the head-shaking. But by this time the weed had been dropped. Then they drifted apart, and began feeding.

The fact that all these elaborate displays were long antecedent to the act of pairing, which was unaccompanied by any striking movements, is very remarkable. But the antics which have just been described were evidently excitants to the final act. The course of true love, even with grebes, does not seem always to run smoothly. At any rate, Mr. Selous on one occasion saw one grebe attack another by diving and spearing his adversary from below, evidently inflicting a sharp stab. But whether these two were rival males or rival females he does not say, and no other similar records seem to have been made which would throw light on the mystery.

Mr. Huxley's notes on this aspect of the grebe's life-history, while confirming those of Mr. Selous, also amplify them. But Mr. Selous seems to have witnessed some quite extraordinary behaviour in regard to the act of pairing on the part of the owners of a nest he had under observation, inasmuch as on more than one occasion the rôle of the sexes was reversed. After this pantomime, both would leave the nest and start feeding, and sometimes the female would return, when pairing would be duly performed. It would seem that the behaviour of the male was calculated to arouse response in the female. Both observers agree that coition never takes place save on the nest.¹

Both birds seem to take part in the actual construction of the nest, which is commonly a sort of floating raft securely anchored. All the materials of which it is composed seem to be brought from the bottom of the water. Mr. Selous counted as many as one hundred

¹ For further particulars see E. Selous, *Zoologist*, 1901, p. 165; and Mr. Leonard Huxley's forthcoming work.

attained its maximum thrust. When they reached the parent she would, in the case of the younger birds, administer to the first arrival a small fish. In the case of older birds the prey was dropped on the water and the youngsters were made to try and pick it up for themselves. Once or twice, as if irritated at their clumsy efforts, I saw her impetuously pick up the victim and swallow it herself. Often, as the fish feebly struggled to swim away she would catch it again, pinch it, and drop it before her complaining offspring. Sometimes she would cover the distance between herself and her offspring in a series of short dives, the fish gleaming in her beak at each appearance, whereby, it would seem, she was, in a vague sort of way, endeavouring to suggest the source of their food to the oncoming youngsters. Immediately she had disposed of her spoils she would dive, and commonly the larger youngsters would follow suit, to the best of their ability. But diving evidently requires practice, for they reappeared instantly. They did no more, in fact, than "duck" under.

A word as to the coloration of nestling grebes. These, as already mentioned, are longitudinally striped; and furthermore, have a curious bare, slightly raised, heart-shaped area of vermilion coloured skin in the middle of the forehead. What purpose can this serve? Is it a vestige of a sometime ancestral character, or does it serve as a recognition mark to the parents when the young are in hiding? Perchance a little closer observation of the young may settle this point. It is curious that no such structure exists in the adult. The colour scheme of the body is, as in the case of the young emu, continued on the beak, which is grey, barred with black. That the longitudinal stripes, an ancestral character without doubt, serve the purpose of a mantle of invisibility when occasion demands that these young should take refuge in the reeds, there can be no doubt. They need such protection, for, unlike the parents, they cannot, at this tender age, escape their foes by diving.

That the nuptial dress of the adult is protective is attested by

Miss E. L. Turner, who remarks, "When the adult grebe is . . . sitting motionless . . . amongst the reeds, I have been much struck with the protective nature of the colouring of the rich chesnut cheeks and olive-brown crest and ear-tufts. Several times I have found myself staring hard at what appeared to be dead and decaying reeds, such as often cling to the base of the 'colts,' as broadsmen call the young green reeds, but the sudden glint of a bright eye would warn me that the apparently dead reed was something very much alive, and intent on my hiding-place."

Why should the colour of the iris change so remarkably between the juvenile and adult stages? In the former it is straw-yellow, in the latter carmine.

One other peculiarity of this species remains to be noted. And this is the observation of Miss Turner, that coots and grebes generally build near together; perhaps, she suggests, "because both being wary birds, some amount of mutual protection is [unconsciously] gained."

THE SLAVONIAN, REDNECKED, AND BLACKNECKED GREBES

[W. P. PYCRAFT]

The Slavonian and blacknecked grebes breed with us in a few favoured spots, and sparingly, but in their habits they do not appear to differ in any essentials from the great crested-grebe, so that these two species, and the blacknecked-grebe, which has never bred with us, may well be considered together.

That all three bear a common likeness to one another and to the great-crested and little-grebes, when surveyed in their post-nuptial dress, is only what we should expect—though the likeness is never so close as to leave any doubt as to the identity of each. But these resemblances vanish with the assumption of the nuptial livery, which

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That all three bear a common likeness to one another and to the great-crested and little-grebes, when surveyed in their post-nuptial dress, is only what we should expect—though the likeness is never so close as to leave any doubt as to the identity of each. But these resemblances vanish with the assumption of the nuptial livery, which

presents a series of startling contrasts. The great-crested, the red-necked, and the Slavonian-grebes all display "ruffs" and "ears," but these ornaments attain their greatest development in the first-named species. The fact that in their coloration these ornaments are so strikingly different is curious, having regard to the similarity these birds exhibit when their ornaments are shed at the autumn moult. It is also curious that the white breast, with its satin sheen, should be masked by a dull slate-coloured hue in the nuptial dress of the dabchick, though the rednecked-grebe shows a tendency to develop the same peculiarity. Of the more ornate types it would be hard to say which is the most beautiful, but perhaps the palm must be given to the Slavonian-grebe, *P. auritus*, which when in full nuptial dress, Professor Newton remarks, "presents an extraordinary aspect, the head being surrounded as it were by a nimbus or aureole, such as that with which painters adorn saintly characters, reflecting the rays of light, and glittering with a glory that passes description." But while a more or less gaily coloured nuptial dress is characteristic of the grebes, it is by no means universal, for there are two species—the western grebe, and Clarke's grebe of Western N. America—which the year round are clad in sober grey and white, without ornament of any kind. There can surely be nothing in the environment controlling this absence of colour, for a subspecies of the British eared-grebe is also found there, and this of course has a conspicuous nuptial dress.

Of their habits and behaviour during the period of "courtship" there seem to be no records, but it seems clear that, as with the great crested-grebe, and the dabchick to be presently described, both sexes share in the work of building the nest and in the task of incubation, and we may assume therefore of feeding the young.

As with the dabchick so with the Slavonian-grebe, if danger threatens the young they are borne off into safety under water, the parent clasping its offspring to its body by the pressure of the wings.

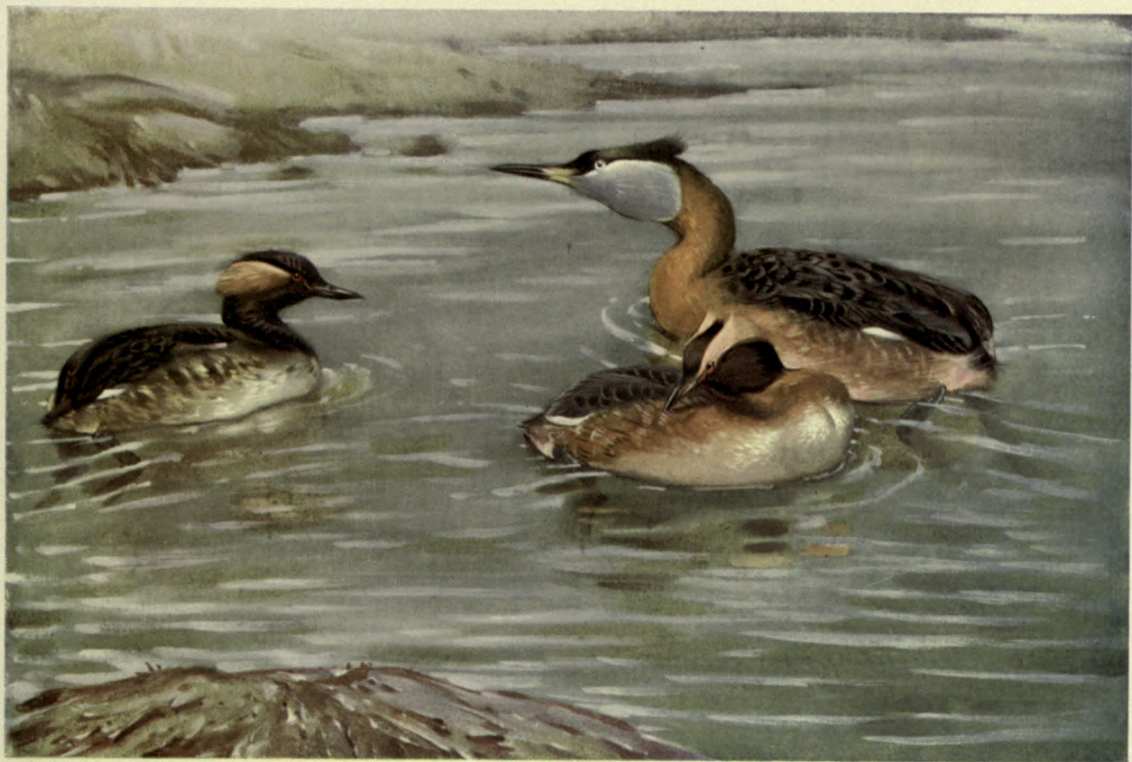
The nest appears, in each of the species now under consideration, to be a floating structure; but the Slavonian-grebe, according to

Plate 176

Upper: Rednecked-grebe (largest); black-necked-grebe (left) and Slavonian-grebe

Lower: Little-grebe or dabchick
uncovering eggs

By A. W. Seaby



Seebohm, will sometimes build on a tussock of grass. But he does not seem to have taken any pains to discover whether this departure was probably a mere individual idiosyncrasy, or was due to some change, albeit but temporary, in the environment.

It is to be hoped that some day the very obvious gaps in our knowledge of the life-history of these birds will be filled in. But even the material at hand has not been properly utilised, for these striking differences in ornamentation, and in the length of the beak, present problems of the first magnitude. So far, however, one might almost suppose that those who have had the opportunity of studying these birds in their native fastnesses have been content to note that they eat fish, and grow feathers, and brood white-shelled eggs on a floating nest, as if this were the inevitable end of our knowledge. Yet these are the data out of which what we really want to know is to be woven.

Why, having regard to the uniformity of habits and habitat which these birds present, do we meet with such diversity in appearance? Why is the beak of the blacknecked-grebe so conspicuously tip-tilted? Why is that of the great crested-grebe so much longer than in its allies? What is the purpose of the white layer which covers the green egg-shell? Only when we have made some attempt to answer these questions shall we begin to glean an insight into the real natural history of the grebes. And it is the prime aim of this book to stimulate an interest in these problems, and this aspect of ornithology too long neglected.

THE LITTLE-GREBE OR DABCHICK

[W. P. PYCRAFT]

The little-grebe, or dabchick, is at once the smallest and the most numerous of our native Grebes, yet, on the whole, save in specially favoured localities, it is less frequently seen, hence we know less of its

habits than of those of the great crested-grebe. Compared with this last it suffers considerably, being far inferior both in size and coloration, though it is a conspicuously more active bird. In its haunts it is perhaps less fastidious, for it will contrive to find contentment alike on lakes, small ponds, and streams, and brackish water estuaries: and this during the breeding season. In winter, like its larger relative, it leaves its inland retreats in small parties and betakes itself to the sea or to small ponds near the coast. That it is more active on the wing than the great-crested species is demonstrated by the fact that it travels round the coast at night, and this has been established by the numbers taken at the lighthouses round the coast of Ireland during the winter months. On land, when taken unawares during short inland forays, it escapes by running, and travels with surprising speed to the water. As a diver, as might be supposed, it is an adept. As to the method of its progress under water accounts differ, for while most authorities seem to agree that it progresses by frog-like movements of the feet alone, others insist that the wings also play no unimportant part.¹ According to Mr. Edmund Selous,² when about to dive it leaps upwards, and describing an arc descends cormorant-fashion into the depths, though at other times it will vanish silently, leaving scarcely a ripple. At times, according to this author, when disporting itself on the water it will flick up water with its tail to a height of twenty feet! That this is an amazing performance every one will admit who has tried to find the dabchick's tail. I sought for this with considerable patience some time ago,³ and at last discovered a few degenerate feathers which may be graced by the name of rectrices.

In its choice of food it does not seem to differ much from the great-crested species. Aquatic insects, small fish, and tadpoles form its staple diet during most of the year, and records of dabchicks choked to death in attempting to swallow the "Miller's Thumb" (*Cottus gobio*) are not rare. When perforce obliged to hunt for a living in the sea,

¹ Ussher and Warren, *Birds of Ireland*, p. 382.

³ *Ibis*, 1900, p. 469.

² Selous, *Bird Watching*, p. 155.

shrimps and other small Crustacea form no inconsiderable portion of its diet. According to the custom of its tribe, feathers are swallowed for digestive purposes instead of stones.

Of its habits during the pairing season there seem to be no records, but in the fashion of its nest it agrees closely with its larger relative; for its nursery is nearly always a floating structure, formed for the most part of weeds brought up from the bottom of the water. Nests, however, according to Seebohm, are occasionally found in the branches of a tree a foot or two above the water, but it did not seem to have occurred to him that they may have been left there by the fall of the water, the nest having been built above submerged branches.

During incubation, in which both sexes take part, the eggs are covered by weeds seized in the beak, before they are left by the brooding bird. Only when the eggs are about to hatch does this precaution seem to be neglected, from which it would seem warmth rather than concealment is the end to be secured, and this surmise seems to receive support from St. John's¹ remarks on a pair which he kept under observation, for he describes the female as leaving her eggs, carefully covered up, for long periods during the day while she spends her time "playing about on the water with her mate."

The young can dive, according to Ussher, as soon as they leave the egg, using both legs and feet as organs of propulsion. And the late Professor Newton (*Ibis*, 1889, p. 577) relates an instance of a bird which could not have been more than twelve hours old, but which crawled across a table, dragging itself forward by means of its wings as much as propelling itself by its legs. As with the great crested-grebe, the young are occasionally carried on the back of the parents. But it would seem, when danger threatens, they are borne not on the back but pressed close to the parent's body beneath the wings. Thus clasped, the parent will dive with them to a place of safety. At other times, however, when the alarm signal is given the whole family

¹ *Wild Sports of the Highlands*, p. 167.

scatter amongst the reeds, and there, in concealment, they await the propitious moment for emergence.

Until the young are somewhat advanced they remain during a great part of the day on the nest, beneath the wings of the mother, and are provided with food by the male. On his appearance with some tempting morsel, one or other of the brood thrusts out its head from the mother's wing to receive it. In their coloration they resemble the young of the great crested-grebe, but the striping is not so vivid, and the red patch on the crown is wanting.

At no time does the breast of the adult display the silvery whiteness so characteristic of the great crested-grebe, though the feathers present the same satin-like sheen. Is this fact in any way concerned with the environment, or is it, in both cases, a matter of specific idiosyncrasy, of no special importance in the struggle for existence? Nor does the iris of the dabchick present the same striking difference between youth and age which is seen in the case of the great crested-grebe.

The difference between the nuptial and post-nuptial plumages are by no means so strongly marked as in the case of its larger relative *Podiceps cristatus*, but whether this fact has anything to do with the need for concealment, or whether it is merely a phase in the evolution of a more resplendent dress, we cannot say.

THE DIVERS

[ORDER: *Colymbiformes*. SUBORDER: *Colymbi*. FAMILY: *Colymbidæ*]

PRELIMINARY CLASSIFIED NOTES

[F. C. R. JOURDAIN. W. P. PYCRAFT. A. L. THOMSON]

GREAT NORTHERN-DIVER [*Gavia immer* (Brünnich); *Colymbus glaciális* Linnæus. Loon, herring-loon, cobble; herring-bar (Kent); nauk (Northumberland); ember, imber, or immer-geese (Scotland). French, *plongeon imbrim*; German, *Eis-Seetaucher*; Italian, *strolaga maggiore*].

1. **Description.**—The great-northern may readily be distinguished from the blackthroated-diver in its nuptial dress by the median throat patch of white marked by vertical lines of black, and a similar but much larger patch lower down the neck and on each side. In its winter dress the upper parts are of a dark ash-brown, and each feather has an ash-coloured margin, while the wing-coverts are unspotted. The sexes are alike. (Pl. 177.) Length 30 in. [762 mm.]. In the nuptial dress the head and neck are black, glossed with purple and green. At the base of the throat is a median band of white marked with vertical lines of black, and lower down, on each side of the neck, is a similar but much larger patch forming a half collar. The back and wing-coverts are glossy black, the scapular feathers sharply truncated, and ornamented with quadrangular pairs of spots of large size. The interscapular feathers are similarly shaped and marked, but the spots are smaller. The rump, flanks, and wing-coverts are also black, and speckled with small round white spots. The breast and abdomen are white. Beak black, cutting edges bluish horn; iris red. Legs and toes blackish, lighter on their inner surfaces. After the autumn moult the plumage assumes a dark brownish grey, each feather of the back being margined with light ash-grey; the head and neck brown glossed with green, save the throat and fore-neck, which are white, like the breast and abdomen. The flanks are coloured like the back. This dress, in fully adult birds, is speedily

exchanged for the more resplendent livery, new black and white feathers making their appearance almost immediately after the autumn moult. The juvenile dress differs from that of the adult in winter in having the white of the fore-neck freckled with brown, and the scapular feathers more rounded at the ends. The beak is also shorter. The downy nestling is of a deep sooty brown, paler on the fore-neck, the breast white. [W. P. P.]

2. Distribution.—This fine species is only a winter visitor to the British Isles, and its nearest breeding-ground is Iceland, where it is not uncommon, one or two pairs nesting on most of the larger lakes. It has no other European breeding station, but nests in Greenland up to about 70° on the east and west sides, and in N. America inhabits not only the Arctic coasts and the larger lakes of Canada, but ranges down the east coast south to the northern United States and Maine, while westward it ranges to Great Slave Lake and Alaska. During the winter months it occurs off the coasts of Norway, and has once been recorded from the Baltic, while it is not uncommon on the Atlantic coasts of Europe, ranging south to the Azores and Madeira. It has also occurred in the Mediterranean (Algeria, Sardinia, Italy, etc.), and on inland waters in Bohemia and Transylvania, as well as the Black Sea; while American birds migrate south to Mexico and California. [F. C. R. J.]

3. Migration.—A winter visitor and bird of passage to our area, but “seldom long absent” from the north of Scotland, and sometimes recorded in June on the west of that country (cf. Saunders, *Ill. Man. British Birds*, 2nd ed., 1895, p. 709), and it may arrive as early as 12th July, although more normally not till 16th September (cf. Clarke, *Studies in Bird Migration*, 1912, p. 162). On the Yorkshire coast it is of regular but not common occurrence from September to April or May, but it is a rare and irregular visitor to Kent (cf. Nelson, *B. of Yorks.*, 1907, p. 732; and Ticehurst, *B. of Kent*, 1909, p. 536). It is only an occasional visitor to Dumfriesshire, but not uncommon in North Wales (cf. Gladstone, *B. of Dumfries.*, 1910, p. 454; and Forrest, *Fauna of N. Wales*, 1907, p. 404). To the Irish coasts, especially those of the north and west, it is a regular visitor from October to April or May (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 371). That immature birds are everywhere more frequently reported than adults is doubtless largely due to the fact that the former come closer inshore and into the estuaries, and are also more easily approached and shot (cf. Saunders, *loc. cit.*). At the migration season examples are not infrequently reported from inland waters. Not gregarious as a rule, although several may often be seen on the same fishing-ground; but in



Photo by J. T. Proud

Blackthroated-diver's nest and eggs



Photo by J. C. Crowley

● Redthroated-diver's nest and eggs

Ireland they have been described as "gathering into small parties previous to their departure" for their summer quarters (cf. Ussher and Warren, *op. cit.*, p. 372). [A. L. T.]

4. **Nest and Eggs.**—Does not breed in the British Isles. [F. C. R. J.]

5. **Food.**—Mainly a fish eater. As more than half the year is spent at sea, the greater part of its food consists of marine species. Saxby mentions sand-launce (*Ammodytes lancea*) and young coal-fish as being favourite prey; Blake Knox found it feeding on flat fish, herrings, and "cobblers" or father-lashers in winter; Montagu adds sprats, smelts, atherines, and spotted gobies; and Chapman specially mentions flounders. One is recorded in the *Zoologist* (1894, p. 265) as having been choked by a grey gurnard (*Trigla gurnardus*). St. John noticed that off the Scottish coast it hunted the rocks for sea-slugs, small crabs, etc.; and Mr. R. Ball records the body of a shore-crab, *Carcinus mœnas*, without the claws, razor shells, *Solen siliqua*, and a species of *Portunus*. During the breeding season in Iceland it subsists chiefly on trout and char. The young are fed by both parents on these fish. It is a voracious feeder, and a bird shot in January has been known to throw up thirty-two fish, some big enough for bait. [F. C. R. J.]

BLACKTHROATED-DIVER [*Gavia arctica* (Linnæus); *Colymbus arcticus* Linnæus. Sprat-loon; herring-bar (Kent). French, *plongeon à gorge noire*; German, *Polar-Seetaucher*; Italian, *strolaga mezzana*].

1. **Description.**—The blackthroated-diver can always be distinguished in its nuptial dress by the black throat longitudinally streaked with white, and in its winter dress by the uniform dark ash-brown colour of the upper parts, relieved only by a few white spots on the wing-coverts. The sexes are alike. (Pl. 178.) Length 28 in. [711 mm.]. In the nuptial dress the forehead and fore-part of the crown are of a dark slate-grey, the rest of the crown, the sides of the head, down to the level of the auriculars, and the upper part of the hind-neck are ash-grey; the throat and malar region and fore-neck down to its middle are glossy black with violet reflections. The sides of the neck, from behind backwards, are white, marked with four longitudinal lines of black; the lower part of the side-neck are similarly marked, but with more numerous black lines. The back and wings are black with glossy green reflections, and set off on the interscapular regions by large quadrangular white spots, and on the scapulars by still larger spots, which by their close approximation form broad transverse white bars. The wing-coverts

are spangled with small round white spots. The flanks are black, the under parts white; iris, carmine; legs and toes pale lead colour, save the outer surface, which is black. After the autumn moult the upper parts are of a deep ashy brown, lighter on the crown and hind-neck, and inclining to smoky brown on the sides of the neck. The throat, fore-neck, and under parts are white. The juvenile dress is like that of the adult in winter, but all the feathers of the back and the wing-coverts are margined with grey. The downy young is of a sooty brown colour. [W. P. P.]

2. Distribution.—As a breeding species in the British Isles this Diver is confined to Scotland, where it nests in small numbers in Perth and Argyll, more numerous in Inverness and Caithness, and commonly in Ross and Sutherland. It also breeds occasionally in the Orkneys, Skye, Coll, and more regularly in the Outer Hebrides. It appears also to have nested in the Shetlands. Outside the British Isles it breeds on the Continent in Norway and Sweden; Finland, especially in the north; Russia, on Kolguev, the south island of Novaya Zemlya, and on the mainland to the Baltic provinces and the governments of Pskoff, Tver, Moscow, Nijni-Novgorod, Smolensk, Kazan, Ufa, and Orenburg, and according to Suschkin, in the Kirghis Steppes. It also breeds in North Germany (Pomerania and Prussia), and is said to have formerly nested in Bohemia. In Asia it ranges south to $49\frac{1}{2}^{\circ}$ in the Turgai, and $52\frac{1}{2}^{\circ}$ in the Tomsk governments and east to Saghalien; and in America it breeds on the Labrador coast and on the shores and islands of Arctic America to Alaska. In winter it migrates south to the Mediterranean, Black and Caspian Seas; in the Pacific, to Japan; and in America casually to Colorado, Nebraska, Iowa, Ohio, and New York. It is also a casual visitor to the Færoes, but its occurrence in Iceland requires confirmation. [F. C. R. J.]

3. Migration.—Resident in small numbers in part of northern Scotland (see previous paragraph), more widely distributed as a winter visitor and bird of passage to British coasts, but never common. As a winter visitor it usually arrives between 25th October and 25th November (cf. Clarke, *Studies in Bird Migration*, 1912, p. 162). Even in Dumfriesshire it is uncommon, and chiefly recorded late in the winter and on the approach of spring (cf. Gladstone, *B. of Dumfries.*, 1910, p. 455). Although uncommon in Yorkshire, it occurs inland more frequently than the great northern-diver, but is rarer on the coast (cf. Nelson, *B. of Yorks.*, 1907, p. 735). Southwards it becomes rare, but it is known as an irregular visitor to Kent between November and March, while even adults, which are much less frequent than immature birds, have been recorded from the English Channel, Devonshire, and Wales

(cf. Ticehurst, *B. of Kent*, 1909, p. 537; and Saunders, *Ill. Man. British Birds*, 2nd ed., 1899, p. 713). In Ireland the blackthroated-diver has only been recorded some twenty-five times, including, however, both an adult and an immature example obtained late in July 1906 (cf. Ussher and Warren, *B. of Ireland*, 1900, p. 373; and Ussher, quoted by Witherby and Ticehurst, *British Birds*, vol. ii. p. 421). [A. L. T.]

4. Nest and Eggs.—In Scotland the favoured nesting-haunts are islets on mountain lochs. As a rule it is placed close to the water's edge, less frequently a few yards inland, and in most cases there is no real nest, the vegetation being merely pressed down by the weight of the incubating bird, and withered by the heat of its body. Sometimes a few fragments of heather, grass, or rushes may be found roughly arranged round the eggs. (Pl. LXXVII.) Exeptionally, however, in Norway this diver has been recorded as building a substantial nest for itself of weeds, grasses, moss, etc., but the share of the sexes in building is apparently not mentioned. The eggs are normally 2, sometimes 1 only, though this is exceptional, but three young have been seen together in Norway. The eggs are as a rule much larger than those of the redthroated-diver, and at times rival those of the great-northern in length, though narrower. The colour varies from deep brown to brownish olivaceous and light olive-green, with similar markings to those on the eggs of the great northern-diver. Some eggs are extremely elongated in shape. (Pl. W.) Average size of 78 eggs, 3.33×2.04 in. [84.6×51.8 mm.]. Incubation is stated in Tiedemann's table to last 28 days, but recent observations on this point are altogether lacking.¹ The male takes part in incubation, sharing the duty in turn with the female (Graf Zedlitz). The breeding season in Scotland begins early in May, but is more general after the middle of the month. As two or even three clutches may be laid by a pair which has been robbed, eggs may be found throughout May and June. In Norway near the coast eggs may be found in the first week of May, but often not till a month or five weeks later on the high fjeld, and in the high north eggs may be found in July. Only one brood is reared in the season. [F. C. R. J.]

5. Food.—To a great extent, though not entirely, fish. In the breeding season probably chiefly trout, at times also salmon fry; in Norway chiefly *Salmo eriox*. In winter, however, one was found to contain eight herrings, and Collett records *Palæmon squilla* and various species of *Gobius*. One specimen contained Algæ (tang), sand, small fragments of wood, and vegetable matter, but no animal

¹ Graf Zedlitz apparently records the period on Tiedemann's authority.

food! In South Finland Jägerskjöld states that the chief food consists of crabs (? crayfish). Curiously enough St. John, who killed many in Scotland, only found a fresh-water leech and other similar animals in their stomachs, and believed them to feed on Mollusca rather than fish. The young are tended and fed assiduously by both parents (R. Dann). [F. C. R. J.]

REDTHROATED-DIVER [*Gavia stellata* (Pontoppidan); *Colymbus septentrionalis* Linnæus. Sprat-bar or loon, little naak; herring-bar (Kent); herring-bone, wabble (Devon); lion (Northumberland); loom (Orkneys); rain-goose (Shetlands and Hebrides); galrush (Ireland). French, *plongeon cat-marin*; German, *Nord-Seetaucher*; Italian, *strolaga minore*].

1. **Description.**—The redthroated-diver is at once distinguishable in its nuptial dress by the large patch of red on the throat, and in its “winter” garb by the white speckled pattern on the back. The sexes are alike. (Pl. 178.) Length 24 in. [355 mm.]. In the nuptial dress the head and neck are of a bluish grey, relieved on the crown by blackish mottlings, along the hind-neck by alternate streaks of black and white, and on the fore-neck by a large triangular patch of vinous chesnut. The back and wings are of an ash-brown with an oil-green gloss, and the flanks are greyish black. The breast and abdomen are white. The iris is dark brown; the legs and toes greenish black. At the autumn moult the red on the throat, and the characteristic black and white streaks down the hind-neck, are discarded. The upper parts assume a slaty grey hue, and the feathers of the back and wing-coverts are marked by small elongated paired spots, while the top of the head and hind-neck are mottled with white. The sides of the head, fore-neck, and under parts are white, save the flanks, which are coloured like the back, but unspotted. The juvenile dress differs from that of the adult in winter chiefly in the feathers of the back and wing-coverts, which are edged instead of spotted with white, in having the forehead, crown, and hind-neck brownish slate, and the feathers of the fore-neck tipped with brown, giving a mottled appearance. The downy young is of a sooty brown colour. [W. P. P.]

2. **Distribution.**—In the British Isles this species is more numerous than the blackthroated, and breeds in Scotland in varying numbers from various localities in the Argyll area and South Inverness northward. It is perhaps most plentiful in Caithness and E. Sutherland, and also breeds in most of the Hebrides, as well as in the Orkneys and Shetlands. In Ireland it is only known to breed in one

locality in Donegal, where it has been much persecuted. Outside the British Isles it breeds in the Færoes, Iceland, and Spitsbergen; also on the Continent in the fjeld lakes of Southern Scandinavia, and generally in the north; in Finland and in Russia from Kolguev and Novaya Zemlya south to Lakes Onega and Ladoga, Ilmen, and the Novgorod and Perm governments. In Asia it ranges north to the Taimyr and the New Siberian Islands east to Kamtschatka, the Commander Isles, and probably Saghalien, but its southern limits are uncertain, though it breeds in the Tobolsk government. In America it breeds in Greenland, and from Labrador and Newfoundland to Alaska. On migration it ranges south to the Mediterranean, Algeria, and Lower Egypt, as well as to the Black and Caspian Seas; to Japan, China, and Formosa in Asia; and in America to California, Maine, and Florida.

[F. C. R. J.]

3. Migration.—Resident in parts of northern Scotland (see preceding paragraph), and has also nested in Donegal, but found round all the British coasts from autumn to spring in numbers that point to a considerable influx of winter visitors from more northerly lands, while some pass south to the coasts of Western Europe and to the Mediterranean. Its appearance as a winter visitor to our coasts may take place as early as 13th August, but usually about 12th September (cf. Clarke, *Studies in Bird Migration*, 1912, p. 162); its numbers diminish very early in spring, but examples are commonly met with in April, and often in May. Immature birds are more commonly met with than adults. Sometimes gregarious as a migrant; in Ireland it has been described as flying southwards in October in flocks of five or six, uttering its strange call, while at least fifty were observed flying south-eastwards off Yorkshire in advance of an approaching storm on 20th September 1883 (cf. Thompson, in Ussher and Warren, *B. of Ireland*, 1900, p. 375; and Nelson, *B. of Yorks.*, 1907, p. 737). On Heligoland this bird occasionally "occurs in inconceivable quantities, as, for instance, on the 2nd and 3rd of December 1879, when there was a moderate east wind, with about 13° F. of frost. . . . At a distance of about two miles from the island, as far as the eye or the telescope could reach, these birds were seen moving in one incessant stream, all of them, strange to say, travelling towards the north-east. This migration lasted till about noon, and was repeated on the next day in the same manner and in the same gigantic proportions" (Gätke, *Vogelwarte Helgoland*, Eng. trans., 1895, p. 576).

[A. L. T.]

4. Nest and Eggs.—The nesting-site of this Diver is very often on the margin of a small lake rather than on an island. Although in many cases the nest

is of the slightest possible nature, and consists of a few bents or rushes, and perhaps a few heather twigs round the eggs, or in some cases little except the down-trodden grass, yet as a rule the nests are decidedly more substantial than those of the black-throated-diver. (Pl. LXXVII.) The eggs are normally 2, though sometimes 1 only, and are smaller than those of the other species, ranging from deep umber or chocolate-brown to olivaceous, spotted sparingly as a rule with black. (Pl. W.) Average size of 101 eggs, 2.89×1.82 in. [73.5×46.4 mm.]. Incubation is performed by both parents in turn (Hantzsch), and the male has been shot from the eggs (*Ibis*, 1900, p. 492). Faber estimates the period at 24 to 28 days. It is a later breeder than the blackthroated-diver, and in Scotland eggs may be obtained from about the middle of May onward, and second or third layings through June and even in July. In Sweden the eggs are rarely found before mid-June, sometimes not till July. In Iceland the first eggs are laid early in June. Only one brood is reared in the season. [F. C. R. J.]

5. Food.—Mainly but not entirely a fish eater. During the winter months it has been recorded as feeding on herrings: Thompson says that six, from four to six inches long, were taken from one bird, and Aplin states that sixteen were found in another. Blake Knox includes in its dietary flat fish (especially flounders), herrings, and coal-fish (pollack), but regards herring as the staple food. T. E. Gunn records four dace, three perch, two gudgeon, and two white worms, $8\frac{1}{2}$ inches long, in an adult female. Another contained three small flounders. Bolam thinks flounders are the staple food, but has also found many sand-eels (*Ammodytes tobianus*), some very small; also a shore-crab. Molluscs and crustaceans are also eaten, according to Saunders; E. T. Booth specifies shrimps, and Newton mentions *Apos*. The young are fed, according to E. Selous, chiefly on sand-eels, by both parents. [F. C. R. J.]

The following species is described in the supplementary chapter on "Rare Birds" :—

Whitebilled-Diver, *Gavia adámsii* (Gray) [*Colymbus adámsi*, Gray].

[F. C. R. J.]

THE DIVERS

[F. C. R. JOURDAIN]

The Divers form a very small family, which has been evolved on parallel lines to the Grebes, but is much more restricted in its distribution, being confined to the seas of the Holarctic region. Only five species are known, all of which have been admitted to the British list except the Pacific Diver, *Colymbus pacificus* Lawrence. They are all more or less pelagic in their habits, resorting to fresh-water lakes for breeding purposes, and spending most of their lives in the water. Their diving powers are extraordinary, and they are good swimmers, but they can also fly rapidly, in spite of their small wings. The legs are set extremely far back, so that as a rule they only progress on land by shovelling the body along the ground on the breast, and only rarely adopt the erect position; and the only part of the leg which has any power of free action is that below the tibio-tarsal joint, which is, however, enormously powerful, the tibia being long and having a keel on the anterior surface of the proximal end, to which the powerful muscles which move the tarsus and toes are attached. They are good-sized birds, and extremely tenacious of life. They differ from the Grebes in the possession of a tail, composed of eighteen to twenty stiff feathers, and normally lay only two eggs.

GREAT NORTHERN-DIVER

To the British Isles this splendid bird is only a winter visitor, the few which have been met with during the summer being probably non-breeding birds. It is the largest of three species which are regularly seen off our coasts, and is sometimes met with in considerable numbers. During the winter months it lives entirely at sea, for

it is able to ride out heavy storms, and at the great depths at which it can take its prey the water is always still. It will, however, frequently feed close to the line of breakers, following the shoals of young coal-fish into the voes of the Shetlands. It is generally considered a wary bird, and most of those obtained in winter are immature birds. Directly it finds itself observed, it sinks its body in the water, so that the hind-neck is submerged, and often only the head is visible. Generally its next move is a dive, which is performed very characteristically. There is, as Saxby says, a slight start, and the bird has disappeared, with hardly a ripple to mark the spot. It is so quick a movement that the eye cannot follow it. There is no violent plunge or header;¹ the bird simply vanishes, and reappears at anything from a hundred to four hundred yards away. If still pursued it again disappears in the same way, but if not disturbed it may be seen dipping its bill into the water and quietly sipping it. Under ordinary circumstances the dive is entirely due to the enormous power exerted by the feet. Mr. H. Blake Knox says that it can spring to the height of a man's head, merely by the aid of the feet, though this seems scarcely credible, and inconsistent with the fact that it is unable to take wing except from the water. Saxby also relates an incident which shows what extraordinary muscular strength it possesses. A slightly wounded bird was tossed overboard, with a line fastened to one foot, from a boat thirteen feet in the keel, but light for its size, being built of Norway pine. It managed for many minutes to tow the boat steadily, remaining submerged all the time except when it rose for a few seconds to take breath.² When no special exertion is required, the wings are closely pressed to the sides, and the whole work is done by the feet. At the Skerryvore light one of these birds got stranded by the tide in a pool some twenty feet long and three feet broad. As the pool was four feet deep, and there was no room for it to use its wings,

¹ E. T. Booth, who had excellent opportunities of watching the dive at close quarters, came to the conclusion that they went down head foremost. The fore-part of the body certainly seems to dip as the bird disappears.

² Saxby, *Birds of Shetland*, p. 278.

Plate 177

Great northern-diver (breeding plumage)

By A. W. Seaby



it was unable to get out, and the lightkeeper was able to watch it for over an hour. When travelling at its greatest speed, but with the aid of the feet alone, the eye could detect hardly anything but a streak from one end of the pool to the other.¹ Both feet were invariably used simultaneously. Possibly this was due to the alarm felt by the bird in its unusual position, for Mr. C. W. Beebe, who succeeded in rearing a young bird from the egg, noticed that its method of swimming was by alternate strokes, and only when a sudden spurt was desired were both used simultaneously. A captive bird kept in the New York aquarium, in a pool twenty-eight feet long and three feet deep, also swam under water with its wings closely folded, never in use; but Mr. Beebe, who has had unusual opportunities of watching these birds, distinctly states that they *do* use their wings at times of emergency to turn quickly, or to get up a burst of speed.² This has been confirmed by so many observations made on birds in a wild state, that the statement made by Mr. A. H. Evans in the *Cambridge Natural History*, that Grebes and Divers "when submerged do not use the pinions," can no longer be maintained³ as an invariable rule. In the case mentioned by Saxby, in which a wounded bird towed a boat, the wings were used, and Messrs. Brewster and F. H. Allen record similar cases; but the normal mode of progression is no doubt by means of the feet alone.

Observation has shown that this Diver travels more rapidly under water than on the surface. Mr. C. W. Townsend noticed that a bird which heard the note of a companion immediately dived in the direction of the sound, and after appearing for a moment, dived again almost at once and repeated the process till he reached his companion. On another occasion one was seen chasing some Mergansers under water. The distance which can be covered in this way varies as a rule from two hundred to five hundred yards, or even half a mile

¹ J. Tomison, *Annals Scot. Nat. Hist.*, 1907, p. 31.

² *The Auk*, 1909, p. 235.

³ *The Cambridge Natural History: Birds*, vol. ix. p. 52. A similar statement is also made by Professor Lloyd Morgan in *Habit and Instinct*, p. 69.

according to some observers ; but there is great discrepancy when we come to compare the different accounts of the time during which it can remain submerged, probably due to the bird having risen unobserved, in the case of such estimates as that of eight minutes by Holböll and ten minutes by Sir R. Payne-Gallwey.¹ Howard Saunders quotes a statement to the effect that a bird was caught in a trammel-net, thirty fathoms below the water surface, at Looe, and given to Mr. J. Gatcombe.

The nearest breeding-place of this species to the British Isles is Iceland, and here we found it fairly generally distributed in June 1912. As a rule one pair had possession of each good-sized lake, while on the large lakes two pairs might be found, each pair keeping to its own end. Nothing is known of the courtship of this species, which probably takes place at sea before the breeding-grounds are reached. Pairing might be expected to take place on the water, but in the case of the closely allied blackthroated species it has been shown that it is performed on the nest, and year after year the birds return to the same nesting-place or within a few yards of it, so that presumably they pair for life. When islands are available they are generally preferred as nesting-sites, but at times nests may be found on little peninsulas or headlands jutting into the lake. One, which contained a couple of fine dark eggs on 11th June, was simply a big depression in the turf, flattened out by the weight of the bird into a shallow depression about eighteen inches across. Close by it was a broad, smooth track, leading by a gentle slope up to the big tussock on which the eggs were laid. Up this slope the incubating bird laboriously pushed herself on her breast with the help of her feet, and down it she slid rapidly into the water when alarmed.² Other nests, however, contain in some cases a little grass and a few stalks carelessly arranged ;

¹ Mr. H. Blake Knox states that a wounded bird was still alive after submersion for a quarter of an hour, but was dead when examined after twenty-five minutes.

² Mr. J. R. Whitaker informs me that on one occasion in Newfoundland he found one of these birds incubating its eggs thirty yards from the water's edge, but this abnormal site was due to the gradual fall in the level of the lake.

while in North America, though some nests are mere depressions in the gravel, a heap of dead vegetable matter, sedge, weeds, bulrushes, etc., is occasionally made near the shore. The normal clutch consists of two eggs, rather elongated in shape, and varying in ground-colour from deep chocolate-brown to some shade of olivaceous or brownish, sometimes without markings and at other times spotted and blotched sparingly with black and a few light inky shellmarks. Average size of 64 eggs, 3.56×2.28 in. [90.5×58 mm.]. It is said that three eggs have occasionally been found in a nest in North America, and in several cases a single egg has been found highly incubated. Both sexes take part in incubation, but observations on this point are not easily made, for long before the nest is reached the sitting bird, warned by her mate, has slid down into the water and disappeared. A minute later her head and back show above the still water of the lake, as she quietly dips her bill in the water, and then raising it apparently sips a few drops. Then we realise that her mate is also present not far away, having suddenly appeared in the same mysterious way. Then even as we watch them, one of the pair vanishes without the slightest apparent effort. In this case the eggs are nearly fresh, so that the parents show little anxiety, but when they have been incubated some time they will come within fifty yards of the observer.

All the Divers seem to have at least two distinct classes of notes: there is a loud wail, often uttered on the wing, and there is also a conversational note or series of notes, usually heard when both are together on the water. This latter sounded to me like a deep loud note, followed by three high-pitched ones, "*yooo, wee wee wee.*" Perhaps it is this which Mr. Blake Knox writes as a loud, hoarse and piercing cry, "*gan-a-ee,*" the first syllable deep, the last like a scream. Quite distinct from this is the loud resonant "*hooo-hoo-hoo-hoo,*" which I have heard echoing over the waters of the lake. This is evidently the note which is given in Naumann's work as "*huhuhuhu,*" etc., or "*uhuuuu,*" and is described by Messrs. Pearson as "a peculiar and rather pleasing trumpeting note." It must, however, be distinct from the blood-

curdling scream, like a man in agony or a tortured child, often heard at night at short intervals for nearly an hour, on one occasion by Hantzsch, and also, according to Mr. Blake Knox, uttered when hard pressed and in fear. Besides these, there is also a sound which Saxby compares to the barking of a small dog, and Knox writes as "*yap, yap, yap,*" and which is often heard in flight.

In Iceland eggs are generally laid early in June, rarely towards the end of May, and occasionally even in July, though these latter may be second layings. Incubation is said by Faber to last for 30 days, and the young are reported to take to the water as soon as they are thoroughly dried—Mr. Beebe states that diving, fish-catching and swallowing them head first are almost congenital instincts, but that they improve much by practice in the first week of their lives. Curiously enough, the young birds can move on land more easily and rapidly than their parents, but progression is always performed by a succession of frog-like leaps and not by walking. Probably they are fed from the first on whole and not macerated fish.¹ Faber estimates the fledgling period at 45 days, and there is little doubt that the young are not fully mature till three years old.

In the water this Diver may frequently be seen to turn over on to its side to preen its breast, and will also raise itself in the water occasionally to an upright position, flapping its wings in the meantime. As to whether it can assume the erect position on land there has been much division of opinion.² There is no doubt that the attitude in which many specimens are set up is impossible, for the metatarsals and phalanges cannot be advanced beyond the line of the tarsus without breaking the joint. This, however, does not render the upright position impossible, but necessitates walking on the tarsus. Sir R. Payne-Gallwey states that he has seen northern-divers stranded among the shallows of Tralee Bay, where they had been left by the receding tide. They sat bolt upright, the head and bill pointing upwards.³ The

¹ C. W. Beebe, *Auk*, 1907, vol. xxiv. No. 1.

³ Quoted in Ussher's *Birds of Ireland*, p. 373.

² See R. W. Shufeldt, *Ibis*, 1898, p. 46.

evidence is even stronger in the case of the redthroated-diver, which has a similar conformation of the feet. Although able to take to the wing without much difficulty from the water, the great northern-diver is apparently unable to rise from land. When in full flight it presents a remarkable appearance, the long, thick neck gives it something of the look of a goose, and the small rapidly beating wings, set far back, look unequal to their task. It will travel for short distances only just above the waves, but in rough weather, or when making long flights, may be seen at a considerable height, and in spring often utters its hoarse screams at such times.

When wounded it will at times lunge fiercely with its powerful beak at the hand of any one who incautiously approaches it. Booth relates how one struck savagely at a crippled heron which fell on to it, and W. H. Hudson states that a gull was killed by a thrust from a bird watched by him. In September the breeding-places are abandoned and the little family parties betake themselves to the sea, and about the same time they begin to arrive at the Shetlands, though many more farther south about Christmas-time, and do not return till the following April or May.

BLACKTHROATED-DIVER

In many respects this species is a smaller edition of the great northern-diver, but its distribution is very different, and it breeds regularly with us, though not in any great numbers. It is decidedly less numerous than the redthroated-diver in Scotland, and is generally to be found breeding on one of a group of low grassy or sandy islets on the larger lochs in the wild and mountainous district between the north of Sutherland and Argyllshire. Graf Zedlitz has recently published some interesting observations on this species as observed by him in Norway and Sweden in the *Journal f. Ornithologie*, 1913, pp. 179-188. He remarks that in South Sweden the black-

throated-diver is invariably found on the large and deep mountain lakes, while the smaller, shallower, and often marshy pools are inhabited solely by the redthroated species. Within twenty-four hours of the time when the ice has disappeared, the Divers are always to be found on the water. On one occasion Graf Zedlitz was able to observe the act of pairing, and noted that it took place on land and not on the water, as might have been expected. Its diving powers are as great as those of the other members of this genus, and Seebohm says that its flight is if anything swifter than that of its allies. Selby timed one under water, and found that in a space of nearly two minutes it had covered a distance of a quarter of a mile under water. H. A. Macpherson times the period of immersion as one minute twenty seconds to one minute thirty-five seconds, with intervals of two or three minutes between the dives, in birds observed by him. The dives were regular headers, the stern being the last to disappear. On the whole it shows more readiness to take to the wing than the other Divers, and Seebohm mentions that at a nest in the Petschora delta both parents flew repeatedly overhead.

Although the courtship of this species has never been described, the late E. T. Booth witnessed some remarkable gatherings of adults in summer. On 18th June 1868, he noticed half a dozen on a loch in Sutherland, which were exceedingly animated, chasing one another above and below the surface, and giving utterance while on the wing and on the water to a variety of harsh cries, occasionally even yelping like a dog. Another party seen three weeks later on Loch Craggie was also sportively inclined, dashing about over the water with loud cries, till a party of eight or ten passing over, they rose and joined them, the whole making for Loch Shin. When flying thus in company, they always kept in line one behind another at regular intervals. It is possible that these gatherings, which sometimes reached fifteen or twenty in number, consisted of birds which had been robbed of their eggs, and were preparing to breed again,¹ or they may have been

¹ E. T. Booth, *Rough Notes*, vol. iii.

composed chiefly of males whose mates were incubating, for at the next visit only a single pair would be seen on the loch. Probably these scenes are a repetition on a limited scale of what takes place in the spring when pairing takes place. St. John says that in May he has seen great numbers of these birds in the Bay of Tongue. The rocks and hillsides resounded with their singular and wild cry as they seemed to be holding a noisy consultation as to their future movements, which at a distance exactly resembled the noise made by a crowd of people shouting and laughing. As evening advanced, the Divers gradually dispersed, leaving in pairs by a direct and rapid flight, after a few circles round the bay, at a great height, towards the mountains. Each pair was evidently on its way to some well-known breeding-place, and as it left the bay, the remaining birds seemed with one accord to salute their departing friends with a shout of mingled laughter, howling, and every earthly and unearthly cry, while those on the wing frequently uttered a short, shrill, bark-like note.¹ Collett also notes that at the seasons of passage they often collect in flocks in Norway, and adds that he has seen as many as eighty on the wing passing over the Kristiana fjord. The notes are difficult to reproduce in words, as may be gathered from the foregoing accounts by Booth and St. John, but it is evident that in addition to the howling or wailing note, which Seeborn compares to that of a child in great pain, there is also a hoarse alarm-note, which Collett likens to a raven's croak, and writes as "*krauo*." This is evidently the same note which Meyer describes as a long-drawn "*kaih*," and according to Naumann is sometimes dissyllabic, "*krau*," sometimes trisyllabic, "*kraou*," and at times more like "*krüük*." Besides these there is also a yelping or yapping note, probably corresponding to Kolthoff's sharp "*hy, hy, hy*," which Blathwayt compares to the quacking of a duck, and is somewhat drawn out when descending to the water, so that it sounds like "*quarra-quárk*." The breeding-habits have already been treated of, so that it is unnecessary to recapitulate here what is to be found in the "Classified Notes."

¹ *Natural History and Sport in Moray*, 1863, p. 290.

Generally speaking, it may be stated that our British-breeding birds make little or no nest, but that in other districts they have occasionally been known to build a substantial nest in shallow water of water-plants and sedges, just as the great northern-diver does under similar conditions. Graf Zedlitz seems to be under the impression that no nest is ever made by this species, but a glance at the photograph reproduced in Mr. A. Chapman's *Wild Norway* (p. 109) will show that there are occasional exceptions to the rule. Like the other Divers, it approaches and leaves the nest on its breast, and so makes a broad smooth track, which rises gradually from the water. Chapman describes how a bird flushed from a nest with two eggs on the point of hatching collapsed after flying thirty yards and fell heavily on the water, apparently with a broken wing. For several seconds she lay flapping helplessly on her side, swimming round as though paralysed, in narrow circles. Half an hour afterwards the same bird was seen with its mate flying fast and strong, a hundred yards high.¹ While incubation is going on, the bird which is not brooding swims about and feeds a hundred yards or more away, and on the approach of an intruder is soon joined by the sitting bird, which cautiously leaves the nest and proceeds under water to join its mate. Although the normal clutch consists of two eggs, it is unusual for more than one young bird to be reared, and one egg is frequently infertile. The young, protected by their thick coat of blackish down, take to the water at an early age, and may be seen following their parents, and occasionally even scrambling on to their backs like young Grebes. A remarkable characteristic which has occasionally been noticed in the breeding season is the extreme boldness displayed by some birds. H. J. Pearson relates how in Russian Lapland a blackthroated-diver which had been put off the bank of a lake, turned round and shook its wings in defiance, and adds that it will sometimes come almost up to land as if about to attack the intruder, when it has incubated eggs.² In

¹ A. Chapman, *Wild Norway*, p. 110.

² *Three Summers among the Birds of Russian Lapland*, p. 161.

Plate 178

Upper: Blackthroated-diver and young in down

Lower: Redthroated-diver and young in down

By A. W. Seaby



the *Fauna of the North-west Highlands and Skye* (p. 343) is an even more extraordinary account of a bird which was accompanied by a single young one, and came straight at a boat, with bill wide open, until almost within reach of the oars, evidently in defence of the young. Mr. G. Bolam once watched two off Spittal beach, whose interest was so excited by a small dog which was frisking about on the sands with some children, that they came within four or five yards of the shore, and were only frightened off when the boys began to pelt them with stones.¹

The remarks with regard to the position in the water and attitudes on land under the heading of the other species apply equally to this, but it may be mentioned that Mr. G. Bolam states that he has seen a blackthroated-diver sitting erect for a moment beside its nesting-place before plunging into the water. Mr. E. W. Nelson² came across one in Alaska which attempted to make its way to a pond some thirty or forty yards distant, and in spite of his efforts the bird distanced him, progressing by pressing downward with the wing-tips and at the same time leaping forward by the combined impulses of feet and wings.

REDTHROATED-DIVER

This is the commoner of our two breeding species of Diver, and is especially numerous in the wet moorlands of Caithness and East Sutherland, where it outnumbers the blackthroat in the proportion of about three to one. In most of its habits it closely resembles its ally, and possesses similar powers of swimming, diving, and flight. Montagu has left on record some interesting observations made on a bird which he found in a canal. This bird made no attempt to fly, and by walking and running after it he was enabled to make a fair

¹ *Birds of Northumberland and the Eastern Borders*, p. 676.

² *Report on the Natural History Collections made in Alaska between the Years 1877 and 1881*, p. 37.

estimate of the pace attained by the bird when swimming on the surface and also when diving. The former he computed at four and a half miles per hour, and the latter at between six and seven miles, while the distance covered at each dive was about eighty to ninety yards. When diving for food, however, P. H. Bahr estimated the immersion period at about one and a half minutes.

Like the other Divers, in bright sunny weather it will roll over on its side and enjoy the warmth of the sunshine on its breast, slowly revolving in the meantime owing to the fact that one foot only is in action. When diving it has been known to use its wings occasionally. Thus Saxby surprised one in a burn and chased it for two hundred yards, the whole of which space was traversed without taking breath. He distinctly saw that the bird was "flying" under water, not merely paddling with its wings as it does sometimes when feeding.¹ O. V. Aplin also notes that one observed by him diving against a strong current, made considerable use of its wings. It is a more sociable bird than the blackthroat, and is rarely seen alone. Collett describes a breeding-place on the islet of Store Tamsö in the Porsanger fjord. Here, on a pond only a couple of gun-shots across, he saw on 3rd July 1872 fifteen nests with eggs. In 1876 he again visited the spot, but the young were already hatched off, and he estimated the number of breeding pairs on the island at about thirty. Another smaller colony of about ten pairs was found by Thomé in the Trondhjems fjord. During the early summer of 1912 I came across a similar colony in south-west Iceland. Some large, flat, grass-covered islands stood in the middle of a wide river, the banks rising some two feet above the water. Redthroated-divers were to be seen in pairs flying overhead with weird cries, while little fleets of half a dozen birds sailed quietly on the river, sipping unconcernedly at the water from time to time. The farmer who owned the islands had collected no fewer than fourteen clutches on the previous day from this colony, but even this did not exhaust the supply, for we saw two

¹ *Birds of Shetland*, p. 282.

or three nests with eggs, besides the numerous empty ones. Each nest had the characteristic landing-place, and in this colony there was no attempt to make any nest beyond a mere hollow in the turf, with an occasional wisp of dead grass. Needless to say, all these birds would lay again, and the taking of the first clutches would have little or no effect on the number of breeding birds as long as they are allowed to hatch off the second laying, or even the third, undisturbed.

Like the other Divers, it seems to have at least two distinct classes of note. There is the loud, plaintive wail, which probably corresponds to the song of other birds, written by Edmund Selous as "*quew-oo-oo*," and there is also the quacking note, which Aplin says is a mixture between the cackle of a guinea-fowl and the bray of an ass and Naumann writes as "*ack ack*" or "*äck äck*." There is also the harsh guttural alarm-note, used to warn the incubating bird of the approach of danger.

With regard to the attitude of this species on land, although the prone position is normal as in the other species, it does occasionally assume an erect stance. Thus Mr. G. H. Caton Haigh once watched one walk deliberately out of the water with the intention of crossing a sand-spit. It walked perfectly upright on its feet, in the same position as a cormorant, but after going a few yards it caught sight of him, and immediately dropped down on to its breast and shuffled back into the water.¹ Mr. G. Bolam also once noticed one of these birds rise from some seaweed and scuttle away to the water in a tolerably upright attitude, at a very fair pace and with a very grebe-like gait.² Mr. R. Godfrey has also seen this species "walk well with distinct laboured steps and slouching belly."³ Although both parents tend and feed the young, Mr. H. J. Pearson noticed that it was the male bird which stayed to look after them when threatened

¹ *Zoologist*, 1892, p. 226.

² *Birds of Northumberland and the Eastern Borders*, p. 679; cf. also Bahr, *Home Life of some Marsh Birds*, p. 32.

³ *A Fauna of the Shetland Isles*, p. 207.

with danger, while the female came only occasionally and left again at once, in this respect resembling the *Limicolæ*; ¹ and Mr. E. Selous' observations tend to show that the young are fed only at long intervals, sometimes as much as seven and a half hours at a time. ² There is a very remarkable observation in a paper by Mr. H. Blake Knox in the *Zoologist* for 1865. He states that on a bright still day in October, while at anchor in twelve feet of water, and having hooked some small dabs, he noticed that the others suddenly scuttled off in all directions, while the three hooked fish burrowed flat into the sand, leaving only the top of the back visible. Suddenly a redthroated-diver appeared above them and poised itself for a moment; then turning over on its back with its head underneath where its feet had been before, it thrust the upper mandible under a fish and then secured it, performing a similar action with a second, and snapping the hooks with a jerk. ³ To this habit Mr. Knox attributes the worn appearance of the top of the upper mandible in this species and the great northern-diver. Dr. Edmonston supposed that this was due to the bird ploughing up the sand with its bill in order to dislodge the fish and worms concealed in it. ⁴ In a subsequent paper Mr. Blake Knox states that each fish as caught is brought to the surface and killed by repeated snaps, shakes, lettings go and catchings again, the bird showing the greatest anxiety when the fish displayed any sign of life. Each fish took five to ten minutes to manipulate before being swallowed, and Mr. Bolam also says that though small flounders are easily swallowed, a fish four or five inches across is bitten and pinched in all directions, and five to ten minutes are spent before the fish is allowed to pass down the gullet. The hooked fish, about which Mr. Blake Knox writes, must have been very small to have been swallowed at once under water. It is a voracious eater, and Mr. A. Patterson states that forty-two fish, the largest seven inches long, have been taken from the crop of a single bird! Like all the

¹ *Three Summers in Russian Lapland*, p. 35.

² E. Selous, *Zoologist*, 1912, pp. 81, 210.

³ *Zoologist*, 1865, p. 9614.

⁴ *Tom. cit.*, p. 9524.

Divers, the flight feathers of both wings are all moulted simultaneously, probably in a single day, so that for a short time about the end of September or early in October the power of flight is completely lost.¹ To birds so much at home on and under the water this is almost a matter of indifference, for besides man they have few enemies.

There is one strange feat which they occasionally perform on the wing and which deserves mention. When flying at a great height they will descend rapidly, twisting and turning as they hurl themselves earthward, and the rush of air through the primaries causes a sound not unlike the roar of a train, and so disproportionate to the size of the bird, that those who hear it for the first time can scarcely be brought to believe that the sound is really caused by it.²

¹ See W. Farren, *Annals Scot. Nat. Hist.*, 1899, p. 114.

² *Home Life of some Marsh Birds*, p. 34.

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EDITORIAL NOTE

THE following Supplementary Chapters complete the *British Bird Book*, which, begun in 1907, has taken six years to produce.

The primary object of the work is, as stated in the Preface, to bring together from every source, British and foreign, the whole available information relating to the habits of all our species except those so rare that they cannot be said to have, as British birds, any habits worth describing. While showing what information we do possess, the book at the same time reveals what is lacking; it will help, therefore, to direct future research in the required directions, and will save a waste of energy that is not uncommon—that of rediscovering the known.

That the labour involved in producing the work, such as it is, has not been inconsiderable may to some extent be realised by glancing at the "List of Works Consulted" (page 621). It will be realised more concretely when it is mentioned that it was necessary to turn over the pages of every volume of the *Zoologist* and other important periodicals, British and foreign, in order to find out what articles, notes, or letters they contained worth entering in the bibliography of the various species; that the same applied to dozens of county faunal works, and a mass of general literature, also both British and foreign. It is only right to add that some of this work could not have been done but for the generosity of the publishers. They made it, for example, possible to have a special index made of all the entries in the *Field* (from 1853) relating to the habits of British Birds, a task that took many days to complete.

Let us add, in passing, that it would be unjust to our contributors if, from what has been said above, the impression arose that they had been merely content to compile the observations of others. There is much information in the book that is the result of direct personal observation, and much again of this information could have been supplied only by the contributors and by no one else.

The result as a whole shows a considerable increase in our knowledge over what is to be found in previous works of the same kind. This increase is especially marked in the case of sex-displays—a subject about which little or nothing is to be found in previous works, notwithstanding the prominence given to it by Darwin in his *Descent of Man*. Progress is also well marked in the case of migration and nesting habits. On the other hand, it must be confessed that our knowledge of the habits of many species—including familiar species—still remains lamentably inadequate. The task that lies before the field-naturalist is enormous if the next attempt to collect and summarise the facts recorded is to place the study of Bird Behaviour upon a satisfactory footing.

It may with some confidence be asserted that those who attempt the next garnering will not suffer, at least to the same extent, from two serious difficulties that faced those responsible for the present work. The first of these difficulties was that, though there are many excellent observers who know something well worth knowing about a large number of species, there are very few who have made it their business to concentrate their attention upon a few given species and work out their life-history in detail. In more than one case contributors to this book have found themselves in the very unsatisfactory position of having to write about species of which they had little personal knowledge. Now, though it is unquestionable that the specialist himself cannot afford to ignore the experience of others in his own field, and must to some extent be a compiler, if he is to be thorough, it is obvious that he has a great

advantage over the non-specialist in that his knowledge enables him to value and select the evidence with a confidence that cannot be felt by one who is dealing with the relatively unfamiliar. Happily there are not wanting signs that the British ornithologist is turning to specialisation. A notable example has been set by Mr. H. E. Howard in his admirable monograph on the *British Warblers*, and his example is being followed, though it has not been rivalled. The results of this closer study, if rightly pursued, is likely to reveal aspects of bird-life of which our predecessors did not even realise the existence.

The work of specialised observation can, however, only yield the results hoped for if the second difficulty alluded to is met. It is that the study of the Habits of Birds, or, to be more exact, Bird Behaviour—this term being used to cover both habit and instinct—has not yet been brought into proper relationship, on the one hand, with the study of Animal Behaviour, of which it is but a part; and, on the other hand, with that of structure, from which it has everything to gain, and to which it is an essential aid. The importance of this latter relationship has been frequently insisted upon in these pages and elsewhere by our contributor W. P. Pycraft, and it does not require to be emphasised further here. The importance of the connection with Animal Behaviour is dealt with fully in the chapter on the "Study of Bird Behaviour" (p. 596). All that need here be said is that the neglect of this connection was defensible while the study of Animal Behaviour was being set upon a firm foundation. It is no longer defensible now that the foundation is built. Not only has the ornithologist important contributions to make to this relatively new study, but he will find in it a fresh source of inspiration, and a powerful aid to further achievement.

A few words in conclusion as to the plan and scope of the book.

In a work to which there are several contributors, it becomes necessary to bring into harmony the claim of the individual writer to express himself in the way he thinks best, and the claim of the Editor to subordinate individual treatment to the general plan. To strike the just balance between the two is far from easy, perhaps impossible. The tendency in the present work has favoured the individual. The gain has been a vigour and freshness of treatment that is not always conspicuous in works of this kind; the loss a certain weakening of methodical arrangement which is more particularly apparent in the earlier part of the work, owing partly, however, to circumstances that were neither contemplated nor desired, nor, at the time, capable of remedy. The loss, it is hoped, will be practically made good by the completeness of the Index. The gain will be appreciated by all except those who still cherish the illusion—generally from self-interested motives—that science is respectable only when dull.

An adverse criticism levelled at the scope of the work was that not enough space is given to the geographical distribution of species. By one or two reviewers, who did not take the trouble to read the Preface, it was even assumed that a full treatment of distribution was part of the purpose of the book. The Preface states that "a detailed account of the geographical distribution of our birds lies outside the scope of the work, which professes to deal only comprehensively with their habits, but short summaries embodying the most recent information will be found under the head of each species." Any one who reads Mr. Jourdain's summaries under the head Distribution in the "Classified Notes" will hardly deny that what is promised is given. But to have given more, to have supplied a detailed account of geographical distribution, would have greatly added to the size of a work which has—owing again to the generosity of the publishers—already considerably exceeded the limits prescribed. To have given this detailed account within the limits prescribed would inevitably have led to the proverbial fall between two stools. From this blunder the work has happily been saved. It must be judged primarily as a contribution to the study of Bird Behaviour. By almost all our reviewers it has so been judged. And we have every reason to be satisfied with their verdict.

RARE BRITISH BIRDS¹

CLASSIFIED NOTES

[F. C. R. JOURDAIN. W. P. PYCRAFT. T. WELLS]

N.B.—All species or subspecies bracketed are of doubtful occurrence, and, with few exceptions, are not described.

THE CROWS²

[ORDER: *Passeriformes*. FAMILY: *Corvidae*]

CONTINENTAL-JAY (*Garrulus glandarius glandarius* (Linnæus). French, *geai*; German, *Eichelhäher*; Italian, *ghiandaia*).

1. **Description.**—The continental race of the jay may be distinguished from the British jay by the delicate lavender-grey which tinges the hind-neck and mantle and the prepectoral region, and by the eyes, which are, as a rule, light bluish white. [w. p. p. and t. w.]

2. **Distribution.**—While the British jay, *G. glandarius rufitergum* Hartert, is confined to Great Britain, and the Irish jay, *G. g. hibernicus* Witherby and Hartert, is only found in Ireland, the continental race is found throughout Europe from the Arctic Circle in Scandinavia and lat. 63° in Russia, south to the Mediterranean, but is replaced by other forms in S. Spain, the Mediterranean Isles, S.E. Russia, etc., as well as in N.W. Africa and Asia. It is only an autumn visitor to the British Isles, and has now been definitely recorded from Kent and Sussex (1910). [F. C. R. J.]

IRISH-JAY [*Garrulus glandarius hibernicus* Witherby and Hartert].

1. **Description.**—The Irish jay has the sides of the head and ear-coverts more rufous and darker than in the British jay, the rich rufous colour reaching to the eyes. The chest, breast, belly, sides, and flanks are much richer in coloration. The throat is not so white as in the continental jay, and is washed with vinous. Length 13 in. [331 mm.]. [w. p. p. and t. w.]

2. **Distribution.**—Recognised in 1911, after the issue of Chapter I. of this work, in which it should be placed. Confined to Ireland, where it is a very local resident, being only found in Leinster and the adjoining parts of Munster, though recently recorded as extending its range into South Ulster. Ussher defines it as resident in the counties watered by the Suir, Nore, and Barrow, wandering more or less to the neighbouring counties. Probably in former times its range was more extensive. See Ussher and Warren, *Birds of Ireland*, p. 87.

4. **Nest and Eggs.**—Does not differ in its nesting habits from the British form, except that the number of eggs laid appears to be smaller, four being an ordinary clutch, and five less common. [F. C. R. J.]

THICKBILLED or EUROPEAN-NUTCRACKER [*Nucifraga caryocatactes caryocatactes* (Linnæus). French, *casse-noix*; German, *dickschnäblige Tannenhäher*; Italian, *noccio-laja*].

1. **Description.**—Distinguished from the Siberian nutcracker by its shorter and thicker bill, by being less heavily spotted with white, and by the feathers of the rump, which are less spotted.

¹ Under this head are here included all the British species or subspecies not described in the preceding chapters.

² Vol. i. p. 1.

Sexes alike in size and coloration. Length 13 in. [331 mm.]. The young differs from the adult in having the whole of the upper and under surface brownish grey, each feather obscurely streaked down the shaft with white. The tail black, broadly tipped with white; under tail-coverts white. [W. P. P. and T. W.]

2. Distribution.—This race is confined to the forests of Northern Europe and the mountain districts of Central Europe, breeding in Norway, Sweden, Gotland, Bornholm, S.W. Finland, the Russian Baltic Provinces (Livonia), Poland, and the governments of Jaroslav, Moscow, and Perm; Germany (East Prussia, Harz, Schwarz and Böhmer Wald, probably also Thüringer Wald); the Jura and the whole Alpine system, including the French, Swiss, Austrian, and Italian Alps; Austro-Hungary (Lilienfeld district, Tatra, Transylvania, and the Carpathians, Styria, Croatia, and Bosnia), and Bulgaria (Rhodope Mountains). There seems to be no proof of its breeding in the Pyrenees. Though more or less resident, it is given to wandering during the winter months, and has occurred in many parts of Europe where it is not known to breed. Six English records, of which four are from Sussex, have been proved to refer to this form. [F. C. R. J.]

THINBILLED or SIBERIAN - NUTCRACKER [*Nucifraga caryocatactes macrorhynchus* Brehm. German, *schlankschnäblige Tannenhäher*].

1. Description.—Distinguished from the European race by the longer and more slender bill, and by the blackish brown upper tail-coverts, of which each feather has a white spot at the extremity of the shaft. The whole plumage is more heavily spotted with white, otherwise the two species are alike. [W. P. P. and T. W.]

2. Distribution.—The breeding grounds of this species are in Asia, across Siberia to Corea, but not in Kamtschatka or in the mountain ranges of Central Asia (Tian Shan and Himalayas), where it is replaced by other forms. In autumn and winter its migrations extend westward through Europe to the British Isles, Scandinavia, France, and Denmark. There are about forty-four records of nutcrackers from Great Britain, most of which probably refer to this form, though few have been properly identified. [F. C. R. J.]

[ALPINE-CHOUGH [*Pyrrhocorax graculus* (Linnæus); *Pyrrhocorax alpinus* Koch].—This species has little claim to a place on the British list, the only occurrence being probably due to an escape from captivity, which was shot in Oxfordshire in 1881. It is an inhabitant of the mountain systems of South Europe, from the Spanish mountain ranges in the west and the Alps in the north to the Apennines, Balkan Peninsula, and Caucasus, and in Asia from Asia Minor and Palestine to Kashmir and Bhutan. It has occurred in Morocco, but is a sedentary species. [F. C. R. J.]

THE FINCHES¹

[ORDER: *Passeriformes*. FAMILY: *Fringillidæ*. SUBFAMILY: *Fringillinæ*]

[CONTINENTAL-GOLDFINCH [*Carduelis carduelis carduelis* (Linnæus). French, *chardonneret*; German, *Distelzeisig*, *Stieglitz*; Italian, *cardellino*].

1. Description.—Differs from the British form in being larger and brighter in colour, in having the neck-spot larger and whiter, the rump and upper tail-coverts whitish, and the flanks and sides darker. The sexes are alike in coloration, excepting that in the male the red of the lower parts of the face extends backwards beyond the margin of the eye, whereas in the female this colour does not extend beyond a line drawn through the eyes. Length 5½ in. [140 mm.]. [W. P. P. and T. W.]

¹ Vol. i. p. 64.

2. Distribution.—Although immigrants from the Continent have been frequently reported from the east coast of England, no specimens have as yet been critically examined. The continental race breeds in Europe north to $64\frac{1}{2}^{\circ}$ in Norway and 61° - 62° in Sweden, but only to 60° in the Urals. Southward its breeding range extends to the Mediterranean, but in S. Spain and Corsica and Sardinia (as well as in Asia and the Atlantic Isles) it is replaced by allied races. Northern birds are migrants, and probably visit us from Scandinavia. [F. C. R. J.]

CITRIL-FINCH [*Carduelis citrinella* (Linnaeus); *Chrysomitris citrinella* (Linnaeus). French, *Venturon alpin*, *serin de montagne*; German, *Zitronenzeisig*; Italian, *venturone*].

1. Description.—Distinguished from the siskin by the absence of black on the head. The sexes are alike in size and coloration, excepting that the female is duller. Length about 5.1 in. [130 mm.]. General colour of the upper parts dull olive-green, with indistinct shaft-streaks of brownish. The rump and upper tail-coverts are bright greenish yellow; primaries and secondaries ash-brown, margined on the outer web with yellowish white; greater coverts blackish brown, tipped with olive-yellow, forming a wing-bar; occiput, hind-neck, and sides of the neck ash-grey; under surface of the body bright greenish yellow; lower abdomen whitish; iris yellowish brown; bill and legs brown. The young bird has the feathers of the upper parts very linnæ-like, *i.e.* brown, heavily streaked with blackish, lightest on the rump; under surface of the body yellowish white, streaked on the throat, chest, and flanks with dusky. [W. P. P. and T. W.]

2. Distribution.—Breeds in the chief mountain ranges of Central and South-western Europe west to the Sierra Nevada in Spain, and from thence in the Pyrenees and Vosges Mountains, the Alpine district, the Apennines (?), the Schwarzwald and the Austrian Alps. In Corsica, Sardinia, and possibly also in Italy it is replaced by a local race. Partially migratory in the autumn and winter months, descending from the mountains and wandering through the low-lying parts of the Continent. One occurrence in England (Norfolk, Jan. 29, 1904). [F. C. R. J.]

SERIN [*Serinus canarius* (Linnaeus); *Serinus hortulanus* Koch. French, *Cini*, *serin*; German, *Girlitz*; Italian, *verzellino*].

1. Description.—Distinguished from the citril-finch by its blunter bill and by having the mantle and flanks streaked with black. The male is brighter than the female. Length $4\frac{1}{2}$ in. [114 mm.]. General colour above greyish yellow, broadly streaked down the middle of each feather with brownish black; forehead, eyebrow, and rump uniform bright yellow; the wings and tail are greyish brown, fringed on their outer webs with yellow; the cheeks and ear-coverts grey; throat, chest, and breast uniform bright yellow, streaked on the sides of the latter with black; abdomen and under tail-coverts creamy white. The young bird is reddish brown above, all the feathers heavily streaked with brownish black; under surface of body pale sulphur-yellow, with black streaks on the chest and flanks. [W. P. P. and T. W.]

2. Distribution.—The continental race of this finch, *Serinus canarius serinus* (L.), as opposed to the true canary, *S. canarius canarius* (L.), which is confined to the Atlantic Isles,¹ is found resident in North-west Africa (Morocco to Tunisia) and the European countries which border on the Mediterranean, from Portugal to Greece, and also in Asia Minor and Palestine. Northward its breeding range extends to South-west Germany, and recently it has spread over the greater part of the country, but is only a summer visitor, migrating in winter to North Africa. It occurs in Holland and may possibly breed there, and has been recorded from Denmark. About twenty records from England, half of which are from Sussex, two from Ireland, and one from Scotland. [F. C. R. J.]

¹ Canaries, *S. canarius canarius* (L.), which have been obtained in the British Isles are undoubtedly escaped from captivity, as in its natural state this species is non-migratory, and is kept in great numbers as a cage-bird.

SNOWFINCH [*Montifringilla nivális* (Linnæus). French, *pinson de neige*, *niverolle*; German, *Schneefink*; Italian, *fringuello alpino*].

1. **Description.**—Resembles the snow-bunting in having the under parts and the secondaries pure white, but it differs from the latter in having the rump black, and the head grey instead of white. Length $6\frac{1}{2}$ in. [165 mm.]. The sexes are alike both in size and coloration, and the adults in winter have the black spot on the chin less clearly defined and the bill orange instead of black; top of the head and back of the neck dark grey, with mesial streaks of black; mantle, scapulars, and back greyish brown; middle of the rump black, sides of the rump pure white; primaries black; primary coverts, secondaries and their coverts pure white; middle pair of tail feathers black, remainder of the tail pure white, slightly tipped with black; under surface of the body greyish white; middle of the throat black tipped with white; axillaries and under wing-coverts white. [W. P. P. and T. W.]

2. **Distribution.**—Confined in the breeding season to the higher mountain ranges of Central and Southern Europe; the Sierra Nevada in Spain (Stark), Pyrenees, the Alpine system, Apennines; Montenegro, mountains of Greece and perhaps also Northern Palestine (Hermon and Lebanon). Replaced by allied forms in the Caucasus and Central Asia. Descends to the lower country in the winter months, visiting Germany and Austro-Hungary. One record from Sweden, and three obtained in England (Sussex and Kent). [F. C. R. J.]

GREENLAND-REDPOLL [*Linóta linária rostrata* (Coues)]¹

1. **Description.**—Is very closely allied to Holböll's redpoll, but may be recognised by the much more obtuse bill, and by being heavily streaked with black on the flanks. The male resembles the female, but the latter lacks the rose-red colour of the chest. Length 5·7 in. [140 mm.]. Top of the head crimson-red. The upper parts, including the wings and tail, blackish brown edged with whitish. In the breeding season these parts have the white edgings worn off to a great extent, producing an almost uniform dark appearance; rump washed with rose colour; chin and lores black; the throat, chest, and upper breast rose-red, remainder of under parts white, heavily streaked with brownish black. The young bird has no red on the crown, the head and back being alike, *i.e.* black, margined with brownish buff, giving these parts a streaked appearance. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in Southern Greenland, migrating south through Canada and the western United States. Has been recorded from the islands of Scotland (Barra, Shetlands, Flannans, S. Kilda, Fair I., etc.) and the west of Ireland (Mayo and Kerry), but not elsewhere in Europe. [F. C. R. J.]

HOLBÖLL'S REDPOLL [*Linóta linária holboelli* (Brehm)].

1. **Description.**—Of doubtful status. It is a larger form of the mealy-redpoll, distinguished by its longer and heavier bill. Otherwise the changes of plumage and the difference in the colour of the male and female are the same as those of the mealy-redpoll (see vol. i. p. 73). [W. P. P. and T. W.]

2. **Distribution.**—As this form appears to breed well within the range of the ordinary mealy-redpoll, it is questionable whether it is due to individual variation or whether it is to be regarded as a distinct form. It has been met with in Northern Europe and Asia, as well as in N. America, and seems generally to breed farther north than its allies, though everywhere somewhat irregularly and in colonies. On migration it occurs irregularly in the British Isles, Holland, Germany, Austro-Hungary, Russia, Central Asia, North Japan, and North-eastern America, sometimes in company with the mealy-redpoll. [F. C. R. J.]

¹ In Section 1 of the *British Bird Book*, *flammea* was used as the specific name of the mealy-redpolls (pp. 72-3). This has been shown by Reichenow to be erroneous, the true name being *linaria* (Linnaeus).

HORNEMANN'S REDPOLL [*Linóta hornemánnii hornemánnii* Holböll].

1. **Description.**—Resembles Coues' redpoll in having the uniform white rump of that species, but it is considerably larger. The white rump distinguishes it from any form of mealy-redpoll. Sexes alike, except that the female lacks the rose-red colour on the chest. Length $5\frac{1}{2}$ in. [140 mm.]. Forehead and top of the head deep crimson-red; the hind-neck, sides of the neck, mantle, and upper back white, suffused with light buff and mesially streaked with black; rump uniform pure white, tinged with rose-colour; upper tail-coverts white centred with brownish black; the wings and tail greyish brown, margined on the outer webs with white; greater and lesser wing- and secondary-coverts broadly tipped with white, forming two bars across the wings; chin black, throat buff, remainder of the under parts white. There is but little difference in the summer and winter plumage, the development of the rosy breast being less pronounced than in any of the other races of redpolls. [w. p. p. and t. w.]

2. **Distribution.**—Breeds in Greenland up to 73° N. Has occurred, probably only as an occasional wanderer, in Franz Josef Land, Jan Mayen, Spitsbergen, Iceland (?), Great Britain (Yorks, Durham, Fair I., and Shetlands), and France. Its regular winter quarters lie in parts of N. America. [F. C. R. J.]

COUES' REDPOLL [*Linóta hornemánnii exilipes* (Coues)].

1. **Description.**—Differs from Hornemann's redpoll in having a wing measurement of only 3 in. [76 mm.], and the chest much more suffused with rose-pink. The difference in the changes of plumage and the colour of the sexes closely resemble those of the mealy-redpoll. [w. p. p. and t. w.]

2. **Distribution.**—A rare casual visitor to the east coast of Great Britain. In the breeding season its distribution is circumpolar, and colonies may be found from Lapland and North Russia through Siberia to North Japan, and from Alaska to Hudson's Bay (Ungava). On migration it has been recorded from East Prussia (rare), Baikal, Japan, and the northern United States. About six British records; three from Yorkshire and three from Fair Island. Apparently hybridises with the mealy-redpoll in Lapland. [F. C. R. J.]

PARROT-CROSSBILL [*Lóxia pytyopsittacus* Borkhausen; *Lóxia pityopsittacus* Bechstein. French, *bec-croisé perroquet*; German, *grosser* or *Kiefernkreuzschnabel*; Italian, *crociere delle pinete*].

1. **Description.**—Distinguished from the common-crossbill by its larger size and the enormous beak. The sexes differ in coloration. Length 7 in. [178 mm.]. Adult male—general plumage of the body above and below dull vermilion, tinged with yellowish on the sides of the mantle, the rump and top of the head being the brightest; wings and tail dull brown, margined externally with yellowish olive in some specimens, in others with red. The adult female has the general colour of the upper parts brownish ash, each feather widely margined with olive-yellow. The rump is pale golden yellow; the wings and tail are ash-brown, margined on the outer web with greenish yellow; under surface of the body greenish yellow, richer on the thighs; iris dark hazel; bill and feet brown. Young birds have the upper parts ash-brown, slightly washed with yellow, and all the feathers mesially streaked with dark brown. [w. p. p. and t. w.]

2. **Distribution.**—The breeding range of this species extends over almost the whole of Scandinavia south to North Skåne; in Russia from Finland to the Baltic Provinces (Esthonia and Livonia) and Poland, according to Dresser east to the Urals, and in Germany somewhat irregularly in E. Prussia, Silesia, and Thuringia. It is also said to breed occasionally in Upper Bavaria and Switzerland. Like the common-crossbill it is at times nomadic, and has occurred in the winter months in most parts of the Continent, west to France and south to Italy and Austro-Hungary. Many recorded, but only two satisfactorily identified (Kent and Middlesex). [F. C. R. J.]

TWOBARRED-CROSSBILL [*Lóxia leucóptera bifasciata* (Brehm). French, *bec-croisé bifascié*; German, *zweibindiger Kreuzschnabel*; Italian, *crociere fasciato*].

1. **Description.**—The twobarred-crossbill may be readily recognised by the two bars of white across the wings, this character being found in both sexes, but the adult male otherwise differs from the female in coloration. Length 6·5 in. [165 mm.]. Top of the head and rump deep rose-red; hinder part of the head and neck ash-brown, faintly margined with dull red; mantle mixed with ash-brown and deep rose-red; lesser wing-coverts dark brown, sometimes tinged with rose-red; median coverts white, forming a band; greater wing-coverts blackish, broadly tipped with white, forming a wing-bar. Tail feathers blackish brown, narrowly edged on the outer web with olive-yellow; cheeks, throat, ear-coverts, chest, and breast rose-pink, darkest on the throat and sides of the body; lower belly and abdomen whitish; under tail-coverts ash-brown, broadly margined with white. The adult female much resembles the adult female of the preceding species, but is at once distinguished by the white double wing-bar. [W. P. P. and T. W.]

2. **Distribution.**—The principal breeding grounds of this species are the forests of Northern Russia, especially those of the Archangel government west to Onega, but it is not known to breed in the Kola Peninsula, though a nest is said to have been taken once at Upsala in Sweden. Eastward it is also known to nest in Siberia, but the eastern birds have been distinguished by some ornithologists as a local race, and range east to Kamtschatka and south to Dauria. During winter and on migration it has occurred in France, Holland, Germany, Switzerland, Austro-Hungary and Poland, and on rare occasions in Italy also. Most English records are from the east coast, also about eleven from Scotland and three from Ireland. [F. C. R. J.]

[AMERICAN WHITEWINGED-CROSSBILL [*Lóxia leucóptera leucóptera* Gm.].

1. **Description.**—Distinguished from the twobarred-crossbill by the wings and secondaries, which are black with two cross bars of white. The sexes differ in coloration. Length 6 in. [152 mm.]. Head, neck, mantle, rump, and most of the under parts pinkish red, varying to orange-red; lower belly greyish white; under tail-coverts black, broadly margined with white; the wings are black, likewise the scapulars, the former with two white bands formed by the white tips to the middle and greater coverts; tail and upper tail-coverts black. The adult female has the wings and tail as in the adult male; feathers of the upper parts blackish brown, margined with yellowish olive; the rump is uniform bright Naples yellow; under parts similar to the upper parts but brighter. The young birds are conspicuously streaked above and below with dusky, on an olivaceous ground; wings and tail much like those of the adult female. [W. P. P. and T. W.]

2. **Distribution.**—It is very doubtful whether this species has any right to inclusion in the British list, though it is said to have occurred three times in England. Its breeding grounds are in the forests of Northern Canada, and on migration in winter it reaches North Carolina, Indiana, Illinois, Colorado, and Nevada. Casual in Greenland and said to have occurred on Heligoland. [F. C. R. J.]

NORTHERN-BULLFINCH [*Pýrrhula pýrrhula pýrrhula* (Linnæus). Russian bullfinch. German, *grosser or nordischer Gimpel*; Italian, *ciuffolotto maggiore*].

1. **Description.**—Distinguished from the common-bullfinch (see vol. i. p. 81) by its larger size (wing 3·75 in. [96 mm.]) and by its brighter coloration. The sexes differ in coloration. Length 6·5 in. [165 mm.]. The adult female resembles the female of the common-bullfinch, but is larger and of a purer grey colour. [W. P. P. and T. W.]

2. **Distribution.**—This large form of bullfinch breeds in Southern Scandinavia, and has been met with sparingly in North Norway, and also throughout the greater part of Central and

Northern Russia, except in the extreme north and the Kola Peninsula. It is not uncommon in the Baltic Provinces and Poland, and also breeds in North-eastern Germany (East Prussia and perhaps Pomerania) as well as in Galizia and Hungary; probably also in Montenegro and Bulgaria, but sparingly. It is only a regular migrant in the most northerly part of its range, though wandering in the winter months over Middle Europe, and occasionally recorded from Italy, Greece, and Asia Minor. To Great Britain it is an irregular winter visitor to the northern islands of Scotland and the east coast south to Norfolk. [F. C. R. J.]

SCARLET-GROSBEAK [*Carpodacus erythrinus* Pallas; *Pyrhula erythrina* (Pallas). Scarlet-rosefinch. French, *roselin cramoisi*; German, *Karmingimpel*; Italian, *verdone bastardo*].

1. **Description.**—Recognised by its crimson plumage. The sexes differ in coloration. Length 6 in. [153 mm.]. General colour of the upper parts crimson, brightest on the head and rump; lesser wing-coverts like the back; median and greater coverts dark brown, with rosy fringes; tail feathers brownish, edged with red; cheeks, throat, and breast bright rose-crimson, gradually merging into the whitish of the lower breast and abdomen; under tail-coverts white, slightly tinged with rosy; bastard-wing, primary coverts, and quills dark brown, fringed with olive; iris hazel; bill greyish; legs and toes brownish. The adult female has the upper parts of an olive-brown colour with dark centres to the feathers, especially those of the head, neck, and mantle; rump and upper tail-coverts uniform brownish olive; lesser wing-coverts like the back; greater coverts dark brown, edged with brownish olive and tipped with yellowish white, forming a double wing-bar; wings and tail olive-brown, edged with yellowish olive; under surface of body yellowish white streaked with brown; abdomen whitish. Young birds may be recognised by the yellow tint on the feathers of the under side. [W. P. P. and T. W.]

2. **Distribution.**—The European breeding-grounds of this species lie chiefly in Russia, but it is not uncommon in some districts of East Prussia, and is said to have formerly bred in Silesia. It also nests in Galizia and parts of North Hungary. In Russia its northern limits extend to middle Finland and the lower Petschora, and south to the lower Volga and Don valleys. In Siberia its breeding range extends east to the Lena, but in Eastern Asia, as well as in Central Asia and probably the Caucasus, it is replaced by allied races. On migration specimens have been obtained not only in the British Isles, but also in Holland, Belgium, S. Sweden, France, Spain, and Italy. From England and Wales there are four records, and fourteen from Scotland up to the end of 1912, six of which are from Fair Island, four from the Isle of May, and three from St. Kilda. [F. C. R. J.]

PINE-GROSBEAK [*Pinicola enucleator* (Linnæus). French, *bouvreuil dur bec*; German, *Hakengimpel*, *Fichtengimpel*; Italian, *ciuffolotto del pinete*].

1. **Description.**—Distinguished by its large size (*i.e.* the largest of all the finches), with a length of over 8 in. [215 mm.]. Sexes differ in coloration. The adult male has the general colour of the upper parts rose-crimson, mottled on the back by ash-coloured bases to the feathers; primaries dusky brown, narrowly fringed with rose-colour; secondaries and their coverts broadly margined with white; tail dusky brown, very faintly margined with crimson towards the base; cheeks, sides of the face, and under surface of the body rosy-crimson; abdomen, thighs, and under wing- and tail-coverts brownish ash. The adult female is slightly smaller than the male, and all the rose-red colour is absent, being replaced with golden olive-yellow. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in Europe only in the north of Scandinavia and Russia. In Norway its breeding range extends south to Saltdalen, and in Sweden it is only found in Lapland.

In Russia it is only found in North Finland, the Kola Peninsula, the Archangel government, the lower Petschora, and the White Sea district. In Asia it breeds in Siberia, but is replaced by a subspecific form in the east, and by others in North America. On migration it visits Germany, and occasionally Austro-Hungary and Italy, and there are about fifty records from the British Isles, though many are not well authenticated. [F. C. R. J.]

THE BUNTINGS¹

[ORDER: *Passeriformes*. FAMILY: *Fringillidæ*. SUBFAMILY: *Emberizinae*]

PINE-BUNTING [*Emberiza leucocéphala* S. G. Gmelin. French, *bruant à couronne lactée*; German, *Fichtenammer*; Italian, *zigolo gola rossa*].

1. **Description.**—Recognised by having the crown of the head pure white. Length $6\frac{1}{4}$ in. [159 mm.]. The adult male differs from the female, and there is a seasonal change of plumage. The adult male has the general colour of the upper parts reddish chesnut, except the crown, which is white; feathers of the mantle mesially streaked with black; lower back, rump, and upper tail-coverts reddish chesnut fringed with whitish; primaries brownish black, narrowly fringed on the outer web with white; secondaries similar to the mantle; tail greyish brown, the three outer pairs with a large patch of white occupying the greater part of the inner web; chin, throat, and sides of the neck rich chesnut; a white collar round the fore-neck; chest and sides of body chesnut, fringed with white; middle of the chest, belly, and under tail-coverts white; axillaries and under wing-coverts white; iris dark brown. The adult female is similar to the male, but the markings are less pronounced. The adults in winter have all the contour feathers fringed with white, especially those of the chest. [W. P. P. and T. W.]

2. **Distribution.**—The breeding grounds of this species lie in Siberia, and extend from the Urals to the mouth of the Amur. It also breeds in N. Mongolia (Bamberg). On migration it is found in North China, Kashmir, Turkestan, Transcaspia, and Afghanistan, and also wanders occasionally westward into Europe, where it has been recorded from Orenburg, Dalmatia, Austria-Hungary, Italy, Heligoland, and South France, as well as once on Fair Island (October 1911). [F. C. R. J.]

BLACKHEADED-BUNTING [*Emberiza melanocéphala* Scopoli. French, *bruant crocote*; German, *Kappenammer*; Italian, *zigolo capinero*].

1. **Description.**—Differs from all the other species of buntings in having a black head and yellow under parts. The male differs from the female, and there is a distinct winter plumage. Adult male is 7 in. [178 mm.] in length, and has the head and cheeks deep black; the mantle, back, rump, and upper tail-coverts are orange-chesnut, palest on the rump; primaries greyish brown; secondaries blackish brown, broadly margined on the outer web with yellowish brown; tail feathers greyish brown, darkest on the outer web; entire under parts rich orange-yellow, brightest on the throat. The adult female is pale chesnut above, tinged with yellow; top of the head brown, streaked with black, and the under parts dull yellow, tinged with orange on the chest. The adults in winter have the feathers of the back fringed with brownish ash and the yellow of the under parts paler. Iris brown; upper mandible brown; lower mandible grey; legs and feet flesh-colour. [W. P. P. and T. W.]

2. **Distribution.**—The breeding range of this species in Europe only includes the Balkan Peninsula and South Russia, but an occasional instance of nesting is recorded from North Italy, and it is common in Dalmatia. In the Balkan Peninsula it is chiefly confined to the countries south of Montenegro and the Balkans. It is also a plentiful breeding species in the Archipelago, Crete, Asia Minor, Cyprus, Palestine, Persia, and Baluchistan. Its normal winter

¹ Vol. i. p. 157.

quarters lie in North-west India, but it occurs casually in South Germany, Heligoland (about fifteen times), Austria, S. France, England (five times), and Scotland (three times), as well as frequently in Italy. [F. C. R. J.]

YELLOWBREASTED-BUNTING [*Emberiza aureola* Pallas. German, *Weidenammer*; Italian, *zigolo dal collare*].

1. **Description.**—The male is recognised by the deep chesnut band across the throat. Length $5\frac{1}{2}$ in. [140 mm.]. Whole of the upper parts deep chesnut; lesser wing- and secondary coverts white, forming a patch on the shoulders; primary flight-feathers and tail dark brown, the outer pair having an elongated patch of white on the inner web; sides of the face, throat, and fore-neck blackish chesnut; remainder of the under surface sulphur-yellow; axillaries and under wing-coverts yellowish white. The adult female is rufous brown above, plainly and broadly streaked with black; lower back and rump inclining to chesnut; no white patch on the shoulders; cheeks and throat buff; remainder of the under surface of the body pale sulphur-yellow; sides and flanks streaked with blackish brown. In the winter the chesnut feathers of the back and throat have ash-grey margins. [W. P. P. and T. W.]

2. **Distribution.**—In Europe this species is only known to breed in Russia, east of Lake Onega and north of lat. 50° . In Asia it breeds across the continent east to Kamtschatka, Manchuria, the Commander Isles, and apparently Japan. Its normal winter migrations extend southward to Siam and India, but it occasionally visits Europe, and has been recorded from Austria, Bohemia, Italy, S. France, Heligoland, and twice from England (Norfolk, 1905 and 1907). [F. C. R. J.]

ORTOLAN [*Emberiza hortulana* Linnæus. French, *bruant ortolan*; German, *Gartenammer* *Ortolan*; Italian, *ortolano*].

1. **Description.**—Distinguished by the uniform chesnut hue of the under parts (*i.e.* with no streaks of black) and by its olive-yellow throat. The sexes differ in coloration. Length 6 in. [152 mm.]. Head dusky greenish olive; general colour of the upper parts reddish brown, with rather broad mesial streaks of black; lower back and rump uniform; primary quills and tail blackish brown, the latter with the two outer pairs of tail feathers marked with white on the terminal half of the inner web; middle of the throat olive-yellow; fore-neck and chest greenish olive; remainder of the under surface of the body pale cinnamon rufous; axillaries and under wing-coverts pale yellow; eyelids white. The adult female resembles the adult male in general appearance, but is much paler below, the under parts being more yellowish. [W. P. P. and T. W.]

2. **Distribution.**—In Europe the ortolan is widely but locally distributed in the breeding season, its range extending north to lat. $68^{\circ} 40'$ N. in Sweden and 57° in the Urals, while southward it is found in the countries north of the Mediterranean and Black Seas, as well as in North-west Africa, and in Asia from Asia Minor and Syria east to Afghanistan and West Mongolia. Though resident in the Mediterranean region, it is a regular migrant in Middle and Northern Europe, wintering in Africa south to Abyssinia, and occurring in Kashmir. Not uncommon on migration in Great Britain, and once recorded from Ireland. [F. C. R. J.]

ROCK OR MEADOW-BUNTING [*Emberiza cia* Linnæus. French, *bruant fon*; German, *Zipammer*; Italian, *zigolo muciatto*].

1. **Description.**—Most nearly resembles the East Siberian meadow-bunting, but lacks the chesnut band across the chest. Length 6 in. [152 mm.]. The sexes are alike, excepting that the female is duller. General colour of the upper parts rufescent brown, with broad streaks of

black down each feather; rump more rufous; superciliary stripe, chin, throat, and upper chest bluish grey; lores, feathers behind the eye, and moustachial streaks black; remainder of under surface cinnamon rufous, brightest on the chest; primaries and secondaries blackish brown, margined with rufous; middle tail feathers black, broadly margined with rufous; remainder of tail black, but with the greater part of the inner webs of the two outer pairs white. [W. P. P. and T. W.]

2. Distribution.—As a breeding species it is chiefly confined to the countries bordering on the Mediterranean, including North-west Africa, the Iberian, Italian, and Balkan Peninsulas, Asia Minor, and Syria; but it is also found breeding locally in S. France, Switzerland, the Rhine valley in Germany, north to Bingen, and locally in Austria and the Transylvanian mountains. In Russia it breeds in the Crimea and the Caucasus. Though resident throughout the greater part of its range, it is migratory in Middle Europe, and winters in North Africa. Five British records, four from Sussex and one from Kent. In Central and Eastern Asia it is replaced by allied forms, which winter in India and China. [F. C. R. J.]

EAST SIBERIAN MEADOW-BUNTING [*Emberiza cioides* Brandt].

1. Description.—Closely resembles the meadow-bunting in general appearance, but is smaller and lacks the small black spot on the chin. The sexes differ in coloration. The male has the upper parts brownish, with distinct mesial streaks of black on the mantle and back; rump and upper tail-coverts uniform rich chesnut; primaries and secondaries blackish brown, the former narrowly fringed and the latter widely margined on the outer web with chesnut; middle tail feathers chesnut, broadly streaked down the middle with black, second and third pairs black, and the two outer pairs black on the outer webs and basal third, and white on the terminal two-thirds; chin and throat greyish white; a chesnut collar across the fore-neck, fringed with grey; remainder of under surface brownish buff, darkest on the sides and flanks. The female is less richly coloured, and lacks the greyish white throat, these parts being greyish ash. [W. P. P. and T. W.]

2. Distribution.—The form, which has once occurred in England, is the eastern race of this species, *E. cioides castaneiceps* Moore, which breeds in Eastern Siberia (Ussuria and the Amur valley), Manchuria, Korea, and part of China, wintering in China. In West Siberia and Turkestan it is replaced by the western form, but the limits of the two are imperfectly known. One was caught at Flamborough, Yorks, in Nov. 1886. [F. C. R. J.]

RUSTIC-BUNTING [*Emberiza rustica* Pallas. French, *bruant rustique*; German, *Waldammer*; Italian, *zigolo boschereccio*].

1. Description.—Differs from the pine-bunting in having the top of the head and the ear-coverts black. The sexes differ in coloration, and there is a slight difference in the winter plumage. Length 5 in. [127 mm.]. Top of the head and ear-coverts black, separated from one another by a broad eyebrow of white; remainder of the upper surface chesnut, with mesial streaks of black on the mantle and back, each feather fringed with ash-grey; median and greater wing-coverts black, with white tips, forming two bars of white across the wing; primary quills and secondaries blackish brown, the former slightly fringed with ash and the latter widely margined with whitish buff and tipped with pale chesnut; middle pairs of tail feathers blackish brown, the two outer pairs with the greater part of the inner web white; base of the chin black; under surface of body white, excepting a broad band of chesnut across the base of the neck and continued down the sides of the body. The adult female is duller than the male and lacks the rufous of the throat, while the head and back are brown streaked with black. The adults in winter have all the chesnut feathers of the upper parts edged with fulvous, especially on the throat band; cheeks and throat whitish, separated by a line of black feathers. [W. P. P. and T. W.]

2. Distribution.—In Europe the breeding range of this species is confined to Norrland in North Sweden, where it has been found nesting in Westerbotten and Norbotten; in Finland, where it breeds regularly, not only on the east side but also near Sotkamo, and North Russia to lat. 62° in the Urals on the east and Russian Lapland on the west side. In Asia it apparently ranges across the continent east to Amuria and Kamtschatka, and is common in Transbaikalia. On migration the main body moves southward to Turkestan and through Manchuria to China and Japan, but some move erratically westward and have been recorded from Austria, Germany, Heligoland, South France, Italy, Holland, and about eleven times from Great Britain. Also casual in Alaska. [F. C. R. J.]

LITTLE-BUNTING [*Emberiza pusilla* Pallas. French, *bruant nain*; German, *Zwergammer* Italian, *zigolo minore*].

1. Description.—Recognised by its black head, with a line of chesnut down the middle. The sexes are alike, excepting that the female is less brightly coloured. Adult male, length 5 in. [127 mm.]. Plumage of the upper parts rufous brown, with distinct black mesial streaks on the feathers of the mantle, back, rump, and scapulars; tail feathers smoke-brown the two outer pairs with an elongated patch of white on the inner web; head black, with a band of deep chesnut down the middle; lores, and a patch under the eye as well as the throat, chesnut; crop region white, with broad black streaks continued down the sides of the body; remainder of under surface white; iris brown; bill brown; feet grey. After the autumn moult the adults become more rufous, with reddish edges to the feathers of the upper parts. [W. P. P. and T. W.]

2. Distribution.—In Europe its breeding grounds are confined to North Russia, where it is found nesting from Onega Bay in the west to the Urals on the east, chiefly between lat. 64° N. and the tree limit. It is locally common in the deltas of the Dwina and Petschora. In Asia it is also found across Siberia east to the mouth of the Amur and Mongolia and south to Turkestan. On migration it ranges through China to North India and Burma, also occasionally to Japan, the Andamans, and Philippines; while a good many have been recorded from Europe—South Sweden, Heligoland, Germany, Austria, Holland, and Belgium, France, Italy, and regularly in small numbers to the British Isles. Most of the records are from Scotland, especially Fair Island; only about six English and one Irish record. Also from Algeria and Asia Minor. [F. C. R. J.]

WESTERN MARSH-BUNTING [*Emberiza palustris palustris* Savi. Western largebilled or thickbilled reed-bunting. French, *bruant des marais*; German, *dictschnäbelig Rohrammer*; Italian, *passera di padule*].

1. Description.—Distinguished from the Eastern race in having the sides and flanks streaked with chesnut. The sexes are different in coloration. Adult male, length 6½ in. [165 mm.]. Head deep black, separated from the mantle by a deep broad collar of white feathers; upper surface of the body reddish brown, very broadly streaked with black; wings greyish brown, margined on the outer webs with chesnut at the base and with buff towards the extremity; middle tail feathers brownish ash, with a broad band of black down the middle; 2nd to 4th pairs black, and the two outer pairs mostly white; chin, throat, and middle of chest black; remainder of under parts white, striped down the sides and flanks with chesnut. Adult female differs from the adult male in lacking the black head and throat, these being blackish brown, streaked with black like the mantle; the white collar of the male is replaced with one of drab-grey, mixed with black; remainder of the under parts similar to that of the male. The adults in winter are more rufous on the wings, and the black feathers of the head are fringed with buff. [W. P. P. and T. W.]

2. Distribution.—Breeds in the south of France, Eastern Spain, Italy, and Sicily. In Northern Italy it is only a summer visitor, but is resident in the south. Casual in England (once Kent, May 1908), and replaced by other forms in Eastern Europe. [F. C. R. J.]

EASTERN MARSH-BUNTING [*Emberiza palustris tschusii* Reiser and Almasz. Eastern large or thickbilled reed-bunting].

1. Description.—Resembles *P. palustris*, but is smaller, and has no streaks on the flanks and thighs, these parts being uniform with the belly. Length $5\frac{1}{2}$ in. [140 mm.]. The adult female resembles the female of *P. palustris*, but, like the male, lacks the streaks on the sides and flanks. [W. P. P. and T. W.]

2. Distribution.—Breeds in the delta of the Danube and in the marshes of South Russia from Bessarabia to Lenkoran on the Caspian Sea. Has occurred once in England (Sussex, April 1912). [F. C. R. J.]

[AMERICAN-SNOWBIRD, *Junco hyemalis* (Linnæus), and WHITETHROATED-SPARROW, *Zonotrichia albicollis* (Gmelin). Said to have occurred in the British Isles, but probably the specimens in question had escaped from captivity. [F. C. R. J.]]

THE LARKS¹

[ORDER: *Passeriformes*. FAMILY: *Alaudidæ*]

WHITEWINGED-LARK [*Melanocorypha sibirica* (Gmelin); *Alaúda sibirica* Gmelin. German, *sibirische Lerche*; Italian, *lodola siberiana*].

1. Description.—Recalling the snow-bunting, but easily recognised by the fact that the white area of the wing is confined to the terminal half of the secondaries. The sexes differ in coloration. Adult male, length $6\frac{1}{2}$ in. [165 mm.]. Top of the head rust-red, faintly fringed with white; back of the head, neck, and remainder of upper parts sandy buff, mesially streaked with blackish brown; long upper tail-coverts rufous, with a broad shaft-streak; lesser wing-coverts bright rust-red, forming a large shoulder patch; primary coverts uniform rust-red; primary quills brownish black, the outermost one white on the outer web; secondaries black at the base and with the terminal half pure white, forming a very conspicuous patch when the wings are open; under surface of the body white, with a few spots of black across the chest and sides of the breast; sides and flanks streaked with black. The adult female differs in lacking the rufous tints, all the upper surface of the body being ash-grey, with black centres to the feathers; under surface similar to that of the male, but the black spots and streaks of the chest are less clearly marked. [W. P. P. and T. W.]

2. Distribution.—In Europe this species is only known to breed in the steppe-lands of the south-east of Russia from north of the Caucasus through Astrakhan north to Saratow and Orenburg. In Asia it has a wider distribution, and breeds in the district from Transcaspia and Western Turkestan to the Yenisei. On migration it has frequently been recorded from Turkey, and casually from Poland, Galizia, Tyrol, Hungary, Heligoland, Belgium, Italy, as well as six times from England (Sussex, three; Kent, three). [F. C. R. J.]

BLACK-LARK [*Melanocorypha yeltóniensis* (Forster); *Alaúda yeltóniensis* Forster. German, *Mohrenlerche*; Italian, *calandra nera*].

1. Description.—Distinguished by its almost uniform black plumage. The sexes are unlike in coloration, and there is a distinct winter plumage. Adult male, length $7\frac{1}{2}$ in. [190 mm.]. Plumage of the whole body black, but most of the feathers of the upper parts have buffy white fringes, especially on the lower back. Adult female—general colour of

¹ Vol. i. p. 199.

the upper surface of the body tawny buff, with broad black centres to the feathers; primaries and secondaries black, the former narrowly and the latter broadly margined on the outer web with yellowish buff; cheeks, chest, and throat similar to the upper parts; remainder of the under parts white, streaked on the sides and flanks with black. After the autumn moult the general colour of the upper parts is white, formed by the white tips to the black feathers, and by the wearing off of these white tips the full black plumage is attained. [W. P. P. and T. W.]

2. Distribution.—In Europe this species, like the last, is only known to breed in the steppes of South-east Russia, chiefly near the salt marshes (Kirghiz steppes), east of the Volga. In Asia its breeding range extends east to Turkestan and north to West Siberia. During the winter it is met with in flocks on the Talysh marshes in Transcaucasia, and also occurs occasionally in Central and Western Europe (Galizia, Heligoland, Italy, Belgium), while four have been obtained in England on the Sussex and Kent borders in 1907. [F. C. R. J.]

[**CALANDRA-LARK** [*Melanocorypha calandra* (Linnaeus)].—Is said to have been captured in England, but the two specimens in question may well have been escaped cage-birds. It breeds in Southern Europe and North-west Africa, from Portugal and Morocco in the west to Tunisia, Palestine, Transcaspia, and Turkestan. [F. C. R. J.]

SHORTTOED-LARK [*Calandrella brachydactyla* (Leisler); *Alaúda brachydactyla* Leisler. French, *aloutte calandrelle*; German, *kurzzehige Lerche*; Italian, *calandrella*].

1. Description.—Recognised by its very short claws, the fore-claws measuring .4 mm., whilst that of the hind-toe only measures 1 mm. The sexes are almost alike in coloration and markings, and there is no appreciable seasonal plumage. Adult male—general colour above, including the scapulars, sandy buff, with broad black centres to the feathers; primaries smoky brown; secondaries darker, but widely fringed with sandy buff; middle tail feathers ash-brown; 2nd to 4th pairs black; outer pairs with an elongated patch of white on the inner web and with the outer margin white; cheeks isabelline, with dusky brown spots; throat and belly white, slightly washed with buff, more distinct on the chest and sides of the body, a patch of concealed black feathers on each side of the upper chest. [W. P. P. and T. W.]

2. Distribution.—In Europe the breeding range of this species extends from Spain and Portugal in the west, through Southern France, Italy, the Mediterranean islands, the Balkan Peninsula and South Russia east to Astrakhan and the Caucasus. It also breeds in North Africa from Morocco to Egypt, and in Asia from Palestine to Asia Minor, while from Transcaspia and Persia east to Tibet it is replaced by allied races. During the migration period it occurs casually north of its breeding range, and has been recorded from Heligoland, Switzerland, Germany, North France, and seventeen times from the British Isles (twelve England, four Scotland, one Ireland). Although sedentary in the southern part of its range, it is partially migratory in the north. [F. C. R. J.]

CRESTED-LARK [*Galerida cristata* (Linnaeus); *Alaúda cristata* Linnaeus. French, *cochevis*, *alouette huppée*; German, *Haubenlerche*; Italian, *cappellaccia*].

1. Description.—Recognised by its long crest, which is more than half an inch long. The sexes are alike in coloration. Length 7 in. [178 mm.]. General colour above sandy brown, with blackish brown centres to the feathers; upper tail-coverts more vinaceous; primaries ash-brown, with buff on the outer web; tail feathers blackish brown, outside pairs brownish buff, with the inner web largely blackish brown; cheeks like the back; throat white, with two longitudinal brownish black bands from the angle of the mouth; chest whitish buff, with blackish brown shaft-streaks; lower breast, belly, and under tail-coverts creamy white; under surface of primaries and axillaries pinkish buff; iris light brown; bill greyish brown, lower mandible lighter and more dusky; feet dusky yellowish flesh-colour. [W. P. P. and T. W.]

2. Distribution.—The breeding range of this species extends over the greater part of the Continent, but it is absent from Norway, the north of Sweden, and North Russia, and the ordinary form is replaced by allied races in the Iberian and Balkan Peninsulas as well as in South Russia. It is absent from Corsica and Sardinia, but is represented in the other Mediterranean islands, and many allied races are found breeding in Northern Africa and also in many parts of Asia. Though resident, it has occurred casually in Norway, and seven times in England (Cornwall and Sussex). [F. C. R. J.]

EASTERN-SKYLARK [*Alauda arvensis cinerea* Ehmeke. Asiatic skylark].

1. Description.—The Eastern form of the skylark is very closely allied to the common-skylark, and resembles it in the general style of coloration (see vol. i. p. 199), but it is a much greyer bird on the upper surface, with a purer white belly and much paler axillaries and under wing-coverts. The adult female is similar in plumage to the male, but is smaller; iris hazel; bill greyish brown above, lower mandible flesh-coloured; feet yellowish brown. [W. P. P. and T. W.]

2. Distribution.—This local race of skylark breeds in Asia, in West Siberia, Turkestan, Persia, and possibly Palestine. It winters in the Caucasus, and also in North Africa from Algeria to Egypt. In the British Isles it has occurred once in Scotland (Flannan Isles), and at least once in Ireland (Co. Cork, 1910). [F. C. R. J.]

THE WAGTAILS AND PIPITS¹

[ORDER: *Passeriformes*. FAMILY: *Motacillidæ*]

SYKES' YELLOW-WAGTAIL [*Motacilla flava beéma* Sykes. Italian, *cutrettola gialla orientale*].

1. Description.—Recognised by its pearl-grey head. It very much resembles *M. flava*, but may be distinguished from that species by its white face and ear-coverts. The sexes are alike, excepting that the female is duller in plumage than the male. Adult male, length $6\frac{1}{2}$ in. [165 mm.]. General colour above yellowish green; median and greater coverts dull brown, margined with yellow; primaries and secondaries blackish brown, margined with olive-yellow; tail feathers black, fringed with yellowish olive; two outer pairs white, with a blackish margin on the basal two-thirds of the inner web; top of the head pearl-grey; chin and a broad eyebrow white; remainder of the under surface of the body brilliant golden yellow; axillaries yellow. [W. P. P. and T. W.]

2. Distribution.—Breeds in Western Siberia from Orenburg to the Yenisei. Occurs on passage in Turkestan, and winters in India. Has been recorded casually from Hungary, once from England (Sussex, April 1898), and once from Fair Island (May 1910), also from Italy and Tunisia. [F. C. R. J.]

GREYHEADED-WAGTAIL [*Motacilla flava thunbergi* Billberg; *Motacilla viridis* Gmelin. Arctic yellow-wagtail. German, *nordische Schafstelze*; Italian, *cutrettola caposcuro*].

1. Description.—Distinguished by its black ear-coverts and by the absence of the eyebrow. The sexes are alike, except that the female is much duller in coloration. Length $6\frac{1}{2}$ in. [165 mm.]. Top of the head and sides of the neck dark slate-blue; lores, feathers round the eye and ear-coverts black; upper plumage dark olive-yellow, lighter on the lower back and rump; primaries and secondaries blackish brown, edged with olive-yellow; tail feathers black, the outer pairs white with a fringe of black on the inner web; chin, throat, and under surface of the body bright yellow; under coverts of the wing and the axillaries yellow. [W. P. P. and T. W.]

2. Distribution.—Breeds in the north of Europe and Asia. In Norway it nests on the

¹ Vol. i. p. 221.

high fjeld south to the Dovre, but in Sweden only to lat. 63°. In Finland it is fairly common at Uleåborg, and in Russia breeds in the Kola Peninsula, the Olonetz and Archangel governments, but not on the Kanin Peninsula or the tundra north of the Arctic Circle. In Asia it breeds across Siberia east to the Sea of Okhotsk. On migration it ranges through Europe, and visits North-west Africa in small numbers; it is more plentiful in North-east Africa (from Egypt to North Somaliland). In Asia its winter quarters lie in India, Ceylon, Burma, and Tennasserim. Visits Great Britain in small numbers, chiefly on the south and east coasts and the Scotch islands. [F. C. R. J.]

ASHYHEADED - WAGTAIL [*Motacilla flava cinereocapilla* Savi. Italian, *cutrettola capocenerino*].

1. **Description.**—Recognised by its pure white throat. The sexes are alike, excepting that the female is duller than the male. Length 6½ in. [165 mm.]. Head, hind-neck, and sides of the neck dark slate-grey; lores and ear-coverts jet black; mantle, back, rump, wing-coverts, and scapulars dark olive-green, lightest on the rump; primary quills and secondaries blackish brown, margined with yellowish olive; tail feathers black, the two outermost pairs for the greater part white; chin and throat pure white; remainder of the under surface of the body golden yellow; axillaries and under wing-coverts pale yellow. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in the countries bordering the Mediterranean east to Montenegro, including Spain and Portugal, probably S. France, the Balearic Isles, Italy, Sicily, Dalmatia, Bosnia, Montenegro, and Herzegovina. Also in N.W. Africa (Algeria and Tunisia). Winters in Africa, and ranges south to Senegal and the Gold Coast on the west and Lado on the east. Recorded twice from England (Cornwall and Norfolk). [F. C. R. J.]

BLACKHEADED-WAGTAIL [*Motacilla flava melanocéphala* Lichtenstein. German, *schwarzköpfige Buchstelze*; Italian, *cutrettola capinera*].

1. **Description.**—Recognised by the deep black feathers round the eye and the ear-coverts. The male differs from the female in coloration. Length 7 in. [178 mm.]. General colour of the upper parts yellowish olive, lighter on the rump; primaries and secondaries greyish brown, the former narrowly and the latter widely bordered with yellowish olive; tail feathers black fringed with yellow, the two outer pairs pure white excepting an elongated patch on the margin of the outer web; the whole of the under parts rich golden yellow; axillaries and under wing-coverts paler yellow. The adult female is much less richly coloured, with the head less marked and the under surface of the body whitish washed with olive-yellow. [W. P. P. and T. W.]

2. **Distribution.**—In Europe this race breeds only in the Balkan Peninsula, South Russia, and the Caucasus; in Asia, apparently also in Asia Minor and West Persia. In the Balkan Peninsula its range extends from Greece north to S. Dalmatia and the Danube valley. Its regular winter quarters lie in Arabia and North-east Africa, south to British East Africa, Sudan, etc., and it has occurred at least four times in England (three Sussex and one Kent), on Heligoland, in Italy, Tunisia and Algeria. [F. C. R. J.]

REDTHROATED-PIPIT [*Anthus cervinus* Pallas. French, *pipi à gorge rousse*; German, *rotkehliger Pieper*; Italian, *pispolo gola rossa*].

1. **Description.**—Recognised by the vinous chesnut throat and the black striations of the rump and upper tail-coverts. The adult male differs from the female. Adult male, length 6 in. [152 mm.]. General colour of the upper surface sandy brown, with narrow blackish shaft-streaks to the feathers of the head, and with wider and black centres to the mantle and rump; primaries and secondaries blackish brown, fringed with whitish buff; tail similar in colour to the wing, but the outer pair largely white; eyebrow, chin, throat, and upper

breast pinkish chesnut, with a few blackish spots on the latter; remainder of the under surface of the body rich buff; sides and flanks streaked with black. The adult female is similar to the above, but has only the throat vinous chesnut and the fore-neck heavily spotted with black. [W. P. P. and T. W.]

2. Distribution.—In Europe this species breeds only in Northern Norway (chiefly in Finnmark), Sweden (in Swedish Lapland), and in North Russia, from Russian Lapland to the tundra beyond the forest growth which borders the White and Kara Seas, as well as on Kolguev, Waigatz, and Dolgoi. In Asia its breeding range extends along the northern coasts of Siberia east to Kamtschatka and the Kuriles, and possibly even to Alaska. On migration it ranges southward in Africa to Nubia and East Africa, while in Asia it winters in Arabia, India, Burma, and in small numbers reaches the Malay Archipelago. To Western Europe it is a more irregular visitor, but has been recorded from the Færoes, Spain, and in North Africa from Morocco, Algeria, and Tunisia. In North America it is of casual occurrence in the Aleutian Isles and S. California. There are seven definite records from the British Isles (two Sussex, one Kent, three the Shetlands, and one Mayo), and it has been seen on St. Kilda. [F. C. R. J.]

SCANDINAVIAN ROCK-PIPIT [*Anthus spinolëta littoralis* Brehm; *Anthus rupëstris* Nilsson. French, *pipi des roches*; German, *Felsenpieper*].

1. Description.—Distinguished from the British rock-pipit (see vol. i. p. 236) by the more vinous under-surface of the body. Length 7 in. [178 mm.]. General colour of the upper parts olive-brown, with indistinct blackish centres to the feathers, especially those of the mantle; primaries and secondaries blackish brown, margined with olive-brown; tail feathers dark olive-brown on the outer web, smoke-coloured on the terminal half of the inner web; cheeks yellowish white, spotted with blackish brown; centre of throat yellowish white; fore-neck and chest olive-yellow, streaked with blackish brown and washed with vinous; remainder of the under surface of the body yellowish white; sides of the body olive-yellow, streaked with blackish brown; iris brown; base of the lower mandible yellow, both mandibles black in the breeding season; legs flesh-colour. [W. P. P. and T. W.]

2. Distribution.—The breeding-grounds of this species lie on the Baltic coasts of Scandinavia, the Cattegat, and the Swedish coast up to lat. 61°, as well as some of the islands in the Cattegat and Russian Lapland west of the Ribatchi Peninsula. Collett states that the form which breeds along the Norwegian coast is the British race, *A. spinolëta obscurus*. During the winter it occurs commonly on Heligoland, and also visits the coasts of Germany, Belgium, and North France, as well as those of Great Britain (English and Welsh coasts, but not Scotland). [F. C. R. J.]

AMERICAN-PIPIT [*Anthus spinolëta rubescens* (Tunstall). Pennsylvanian-pipit].

1. Description.—Distinguished from the water-pipit by the lores, eyebrow, and sides of face, which are vinaceous like the under parts. The sexes resemble one another, but in the female the throat and chest are more spotted with brown. General colour of the upper parts dark ash-grey, with a few indistinct blackish centres to the feathers; primaries and secondaries blackish brown, fringed on their outer webs with whitish grey; tail blackish brown, the two outer pairs largely white; under parts rich ochreous buff, spotted on the chest with blackish brown and streaked on the flanks with black. [W. P. P. and T. W.]

2. Distribution.—Breeds in the Arctic regions of North America from Greenland and Newfoundland on the east side to Alaska and Great Slave Lake on the west. Also on high mountains south to California and Mexico, and in the Aleutian Isles and North-east Siberia. In the winter months ranges south, wintering from the southern United States to Guatemala. Casual on Heligoland (twice), and once on St. Kilda (September 1910). [F. C. R. J.]

THE CREEPERS¹[ORDER: *Passeriformes*. FAMILY: *Certhiidae*]**NORTHERN TREE-CREEPER** [*Certhia familiaris familiaris* Linnæus. German, *nordische Baumläufer*].

1. **Description.**—Differentiated from the British tree-creeper by its shorter bill (measuring from the feathers of the forehead less than half an inch [13 mm.], that of the British form measuring nearly three quarters of an inch [19 mm.]. The upper parts, moreover, are usually whiter. The sexes are alike in coloration. Length $4\frac{1}{2}$ in. [120 mm.]. [w. p. p. and t. w.]

2. **Distribution.**—This race breeds in the coniferous woods of Norway and Sweden up to about lat. 65°, in Finland, Russia from the Olonetz and Vologda governments through the Baltic Provinces to Poland and Central Russia; also in North-east Germany, the Carpathians, and probably the Dobrogea. In Asia its breeding range extends through the forest region of the continent south to the Altai and east to the Sea of Okhotsk, Manchuria, etc. Has been identified with certainty on one occasion from Fair Island (December 1906), and has probably occurred at other times. [F. C. R. J.]

WALL-CREEPER [*Tichodroma muraria* (Linnæus). French, *pie de murailles*; German, *Alpen-Mauerläufer*; Italian, *piccio muraiolo*].

1. **Description.**—Recognised by the rose-crimson on the shoulders and wings. The sexes are alike in coloration, and there is a distinct seasonal breeding-plumage. Length $6\frac{1}{2}$ in. [165 mm.]. The adult in breeding-plumage has the general colour of the upper surface of the body greyish slate, becoming darker on the rump and upper tail-coverts till the tail is quite black, with the exception of a white bar at the tip of the two outermost pair of feathers; primaries black, with two large spots of white on the inner web of each feather, and with the basal half of the outer web rose-crimson; secondaries similarly coloured, but with the spot on the inner web light chesnut instead of white; throat black; remainder of under surface of the body blackish slate. The adult after the autumn moult lacks the black of the throat, these parts being uniform with the remainder of the under surface. [w. p. p. and t. w.]

2. **Distribution.**—This species breeds in the mountain ranges of Central and Southern Europe, from the Iberian Peninsula, the Pyrenees, and the Alpine chain to the Apennines, the Carpathian range, the Balkan Peninsula and the Caucasus. In Asia its range extends eastward from Palestine and Asia Minor through Persia, Afghanistan, Turkestan, etc., to the Himalayas, Tibet, and Mongolia. It probably also nests on some of the Mediterranean islands (Elba, Sardinia, and Cyprus). Outside the breeding season it seems to be rather an erratic wanderer, and has been recorded from Germany, N. France (Brittany and Normandy), the Channel Islands, and five times from England (Sussex three, Norfolk and Lancashire one each), as well as southward in Asia to middle India, and perhaps also to North Africa. [F. C. R. J.]

THE DIPPER²[ORDER: *Passeriformes*. FAMILY: *Cinclidæ*]**BLACKBREASTED-DIPPER** [*Cinclus cinclus cinclus* (Linnæus). Scandinavian-dipper. German, *Wasserschwätzer*].

1. **Description.**—Distinguished from the British and Irish forms (vol. i. pp. 297, 299) by the absence of chesnut on the under surface. This, below the white, is dark chocolate-brown inclining to black. Sexes alike. Length 7 in. [178 mm.]. [w. p. p. and t. w.]

¹ Vol. i. p. 280.² Vol. i. p. 298.

2. **Distribution.**—Breeds in Scandinavia and North Russia, the Russian Baltic Provinces, and apparently also in East Prussia. Though mainly sedentary, some seem to migrate southward in winter to North-east Germany and apparently also to East Russia. In other parts of Europe, North-west Africa, and Asia to the Himalayas, it is replaced by other forms. Has occurred several times in east England in winter, chiefly Norfolk and Yorkshire. [F. C. R. J.]

THE THRUSHES¹

[ORDER: *Passeriformes*. FAMILY: *Turdidæ*. SUBFAMILY: *Turdinæ*]

DUSKY-THRUSH [*Turdus fuscatus* Pallas; *Turdus dubius* Bechstein. French, *merle brun*; German, *Rost-flügeldrossel*; Italian, *cesena fosca*].

1. **Description.**—Recognised by its light chesnut axillaries and under surface of the wing, and by the flanks, which are heavily spotted with blackish brown. Sexes alike, except that the female is duller in colour and has the upper surface more uniform. Length $9\frac{1}{2}$ in. [242 mm.]. General colour of the upper surface of the body reddish brown, with blackish centres to the feathers; rump feathers chesnut-brown; primaries and secondaries blackish brown, with the basal two-thirds of the inner web chesnut and the outer web margined with reddish buff; chin, throat, and cheeks white, tinged with buff and tipped with black; breast and flank feathers blackish brown, broadly margined with white; middle of the chest and belly uniform white. [w. p. p. and t. w.]

2. **Distribution.**—This species breeds in Siberia, north to the limit of tree growth on the Yenisei and almost to the mouth of the Lena, east to Kamtschatka and Bering Island, perhaps also North Saghalien. In winter its regular migrations extend to Corea, Japan, Manchuria, China, Formosa, Assam, and North-west India; but some individuals stray westward, and have been recorded from Russia, Germany (?), Heligoland (once), Norway, Italy, Holland, Belgium, South France, and once from England (Notts, 1905). [F. C. R. J.]

BLACKTHROATED-THRUSH [*Turdus ruficollis atrigularis* Temminck; *Turdus atrigularis* Temminck. French, *merle à gorge noire*; German, *schwarzkehlige Drossel*; Italian, *tordo dalla gola nera*].

1. **Description.**—Recognised by its black throat and upper chest. Sexes unlike in coloration. Adult male, length $10\frac{1}{2}$ in. [266 mm.]. General colour of the upper parts pale greyish brown; top of the head with indistinct mesial streaks of brown; primaries and secondaries ash-brown, slightly fringed with whitish; tail similar to the wing; lores, chin, throat, sides of the neck, and upper breast deep black, some of the feathers indistinctly fringed with white; remainder of the under surface white; sides and flanks tinged with greyish. Adult female differs from the male in lacking the black throat and chest, these parts being white spotted with black; otherwise the upper surface, wings, and tail are as in the male. [w. p. p. and t. w.]

2. **Distribution.**—This form of the redthroated-thrush breeds in West Siberia, in the basins of the rivers Ob and Yenisei, south to the Altai, and, according to Severtzow, the Tian Shan range. During the winter months its migrations extend to Turkestan, Transcaspia, Afghanistan, Persia, Baluchistan, South Arabia (once), North-west India, the Himalaya range, Shan States, Assam, and Manipur. In Europe it has occurred in Finland, Norway, many parts of Germany, Denmark, Austria, Italy (seven), France, Belgium, and four times in Great Britain (two Kent, one each Sussex and Perth). [F. C. R. J.]

¹ Vol. i. p. 317.

WHITE'S THRUSH [*Turdus aureus* Holandre; *Turdus varius* Pallas. French, *merle doré*; German, *bunte Drossel*; Italian, *tordo dorato*].

1. **Description.**—Recognised by its large size and by the broad, black, horse-shoe markings on the upper surface, enclosing a yellow spot. The sexes are alike, and there is no seasonal change of plumage. Adult, length 11 in. [279 mm.]. Feathers of the top of the head brownish black, with a spot of golden buff near the extremity; remainder of the upper surface olive-golden, with a subterminal bar of golden buff and a deep black loop at the extremity of each feather, giving the whole of the upper surface a richly spangled appearance; middle of the throat, as well as the middle of the belly, uniform white; but the flank feathers have a subterminal bar of golden buff and a black tip; primary quills blackish brown, with a fringe of golden buff and with a square patch of yellowish buff at the base of the inner web; axillaries black on their basal half and white on their terminal half. [W. P. P. and T. W.]

2. **Distribution.**—The breeding-grounds of this thrush lie in Eastern Siberia, and extend from the south of Lake Baikal to the Pacific Ocean, and also in the island of Hondo in Japan. In the Riu-kiu group it is replaced by a larger form, and by other races in Java, Lombok, Himalayas, and S. India. Buturlin states that it is not uncommon on the Yenisei and the northern portions of the Akmolinsk and the southern parts of the Tobolsk governments. Specimens in summer plumage have been obtained in the Perm and Ufa governments of European Russia. Its normal winter quarters lie in South China and Formosa, occasionally in Pegu, Assam, and the Philippines; but some move westward and have been met with in West Europe as far as Scandinavia, Heligoland, Germany, Austria, Belgium, France (Pyrenees), Italy, and about twenty times from the British Isles, all from England, except one Scotch and three Irish records. [F. C. R. J.]

[**SIBERIAN-THRUSH** [*Turdus sibiricus* Pallas. French, *merle sibérien*; German, *sibirische Drossel*].

1. **Description.**—Recognised by its uniform slate-grey coloration; but the eyebrow and a line down the middle of the belly are pure white. The sexes are different in coloration. Adult male, length 10 in. [254 mm.]. General colour of the upper parts deep slate-grey, darkest on the head and lores; a long and very conspicuous white eyebrow; primary quills dark brown, edged with slate-grey; an elongate rounded patch of white on the inner web; middle tail feathers uniform with the back; remainder of the tail black, with a small white tip; under surface similar to the upper surface, but with a line of white feathers down the middle of the belly. The adult female has the upper surface dark olive-brown, with a golden buff eyebrow stripe; under parts white, shading into brown on the chest and flanks, each feather tipped with dark olive-brown. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in the valleys of Mid Siberia (Yenisei and Lena), near the Arctic Circle, and migrates through Dauria, Ussuria, and China to farther India, the Andaman Isles, South China, and Java and Borneo. Has occurred casually in Germany (ten), Belgium (two), Holland (two), Bulgaria, France, and twice in England (Surrey and Isle of Wight), but the evidence is not quite conclusive. [F. C. R. J.]

ALPINE RING-OUZEL [*Turdus torquatus alpestris* (Brehm). French, *merle à plastron*; German, *Alpenamsel*; Italian, *merlo dal collare meridionale*].

1. **Description.**—Differs from the common ring-ouzel (see vol. i. p. 329) in having all the feathers of the under surface heavily margined with white. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in the mountain ranges of Central and Southern Europe, from the Iberian mountain systems and the Pyrenees in the west to the Alpine chain, the Apennines, the Carpathians, Tatra, and the mountains of the Balkan Peninsula, but not in Greece. Probably

also breeds in Asia Minor (Taurus), but is replaced in the Caucasus and Elburz ranges by the eastern form. Has occurred in Germany, Belgium, and a few times (at least once, Sussex, 1911) in England. [F. C. R. J.]

[AMERICAN-ROBIN [*Turdus migratorius* Linnæus. Redbreasted-thrush (?). German, *Wanderdrossel*]. Inhabits east and northern N. America, and winters in the southern United States, and occasionally Bermudas and Cuba. Has been recorded for the British Isles, but was in all cases probably an escaped captive. Has recently been introduced. [F. C. R. J.]]

ROCK-THRUSH [*Monticola saxatilis* (Linnæus). French, *merle à roche*; German, *Steindrossel*, *Steinrötel*; Italian, *codirossone*].

1. **Description.**—Recognised by its slate-blue head and throat, and by its bright chesnut under parts. Sexes unlike in coloration. Length $8\frac{1}{2}$ in. [215 mm.]. The adult male has the entire head and neck slate-blue, shading into bluish black on the upper back, rump, and scapulars; middle of the back white, each feather tipped with bluish black; upper tail-coverts and tail reddish chesnut; middle tail feathers with the terminal two-thirds blackish brown; primaries and secondaries blackish brown, tipped with whitish; chest, breast, belly, thighs, under tail-coverts, axillaries, and under wing-coverts uniform chesnut-red; bill, legs, and feet black. In the female the upper surface is brown, each feather indistinctly barred at the tip with black; upper tail-coverts and tail as in the male; under surface of the body pale brownish chesnut, with the subterminal bar of black; axillaries and under wing-coverts pale chesnut. After the autumn moult the whole plumage is spangled with light chesnut above and with whitish below. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in the mountains of North-west Africa, and also in those of Southern and Central Europe (Spain, Pyrenees, France locally, the Alpine region, some of the Mediterranean islands, locally in Germany, Austro-Hungary, Poland, Italy, the Balkan Peninsula, and the Caucasus). In Asia it breeds from Asia Minor, Lebanon, and Hermon east through Persia and Turkestan to South Siberia, Mongolia, and North China. European birds migrate chiefly to tropical Africa, wintering south to British East Africa, the Gold Coast, etc.; and Asiatic birds winter in North-west India and China. Has occurred casually on Heligoland, and five times or more in Great Britain (Sussex two, Orkneys two, and Herts one). [F. C. R. J.]

WESTERN RUSSET-WHEATEAR [*Oenanthe*¹ *hispanica hispanica* (Linnæus); *Saxicola stapanina* (Linnæus); *Saxicola occidentalis* Salvadori. Western blackthroated and blackeared wheatears. French, *cul-blanc roux*; German, *Schwarzkehliger-steinschmätzer* or *Ohren-Steinschmätzer*; Italian, *monachella*].

1. **Description.**—Has the same black wing lining as the eastern russet-wheatear, but it differs therefrom in that, after the autumn moult, the light areas are of a bright ochreous yellow, and in spring, when the plumage is abraded, of a pale cream colour, almost white. The sexes differ in coloration. Adult male, length 6 in. [153 mm.]. Feathers at the base of the culmen, the lores, a stripe over the eye, the ear-coverts, wings and scapulars are of a deep black; the rest of the head, nape, back, rump, and upper tail-coverts are of a bright ochre-yellow; the two central tail feathers black, white on the basal third; remainder of the tail white, tipped and margined on the inner and outer webs with black; under surface cream coloured, deepening into ochraceous brown on the breast. Adult female—forehead, lores, and a stripe over the eyes buff; ear-coverts brownish-buff; upper parts dark buff, with the exception of the rump and

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upper tail-coverts, which are white; tail marked as in the male, but the black portions blackish brown; chin and throat pale buff, lighter on the abdomen and under tail-coverts. [W. P. P. and T. W.]

2. Distribution.—Formerly the blackthroated and blackeared birds were regarded as distinct species, but it is now generally admitted that they are dimorphisms of one species which is found breeding in the western part of the Mediterranean region (North-west Africa, including Morocco, Algeria, Tunisia, and Tripoli, the Iberian Peninsula, South France, North Italy, and S. Tyrol, Istria, etc.). In winter it migrates southward to Africa, crosses the Sahara, and has been recorded as far south as Senegambia. In the eastern part of the Mediterranean region it is replaced by the next form. About ten occurrences are on record from Great Britain, two only of which are from Scotland, and it has been obtained on Heligoland. [F. C. R. J.]

EASTERN RUSSET-WHEATEAR [*Oenanthe*¹ *hispanica xanthomelæna* (Hemprich and Ehrenberg); *Saxicola stapazina* (Linnaeus) nec Vieillot. Eastern blackthroated or blackeared-wheatear].

1. Description.—Resembles the desert-wheatear, but is at once distinguished from that species by the black under surface of the wings. The sexes differ in coloration. Length $5\frac{1}{2}$ in. [140 mm.]. General colour above dusky isabelline; throat, sides of the head and neck, wings, and scapulars deep black; chest, breast, belly, and under tail-coverts white, suffused with brownish buff; middle tail feathers black, white on the basal third; remainder of tail white, tipped with black. During the spring and summer, by abrasion and bleaching, the isabelline tints are more or less completely replaced by white. In the female the general colour of the upper parts is of a uniform brown, darkest on the wings and tail; feathers of the throat buff, mottled with black; breast buff, gradually merging into the white of the under parts; axillaries and under wing-coverts dark brown. [W. P. P. and T. W.]

2. Distribution.—The breeding range of the eastern form extends to the north of the Adriatic (Croatia, Dalmatia, and Montenegro), possibly also in Southern Italy and Sicily, and certainly also in the Balkan Peninsula, South Russia (Crimea), Asia Minor, and Palestine. In the winter it migrates through Italy and North Africa (from Algeria to Egypt) to the Eastern Sudan and Abyssinia. This form has occurred once in England (Sussex, Sept. 1905). [F. C. R. J.]

ISABELLINE-WHEATEAR [*Oenanthe*¹ *isabellina* Cretzschmar; *Saxicola isabellina* Rüppell].

1. Description.—Recognised by the absence of black in its plumage excepting on the terminal half of the tail and on the lores. The sexes are practically alike in coloration, but the female is slightly smaller. General colour of the upper surface of the body sandy brown; primaries darker; rump and upper tail-coverts white; tail feathers white at the base, the middle pair dark brown on the terminal two-thirds; remaining pairs black on the terminal half; feathers in front of the eye black, a white stripe from the bill to the eye; ear-coverts darkish buff; chin white; remainder of the under parts creamy buff; axillaries and under wing-coverts white. [W. P. P. and T. W.]

2. Distribution.—In Europe this species is only known to breed in the steppes of South-east Russia and the valleys of the Caucasus, but in Asia it nests in Palestine, Asia Minor, Persia, Transcaspia, Turkestan, Afghanistan, Baluchistan, the North-West Provinces of India, Tibet, Mongolia, North-west China, and East Siberia. Its winter quarters lie in North-east and East Africa, south to British East Africa, South Arabia, and Western India, but it has occasionally been recorded from Algeria and Tunisia, and four times from England (three Sussex, one Cumberland). [F. C. R. J.]

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AFRICAN DESERT-WHEATEAR [*Oenanthe*¹ *deserti deserti* (Temminck); *Saxicola deserti* Rüppell. Western desert-wheatear].

1. **Description.**—Resembles the eastern russet-wheatear, but may be distinguished by having the inner lining of the wings for the most part white. The sexes are unlike in coloration. Length 6 in. [153 mm.]. Adult male—forehead and superciliary stripes whitish buff; crown, nape, back, and scapulars isabelline buff, more brightly coloured on the mantle and scapulars; rump and upper tail-coverts white, faintly tinged with isabelline; scapulars black; primaries and secondaries black, white on the inner web at the basal two-thirds; tail white on the basal half, black on the terminal half; throat, lores, ear-coverts, and sides of the neck jet black; remainder of the under surface whitish buff; axillaries black. Adult female—upper parts similar to those of the male, but the wings and tail much lighter, the black pattern being replaced by shades of brown. [W. P. P. and T. W.]

2. **Distribution.**—The western form of this species breeds in the Sahara, from Cape Blanco east to Egypt, Nubia, and Arabia. It is chiefly or almost entirely sedentary, but one specimen has been obtained in Sicily, and another, probably of this race, in North Italy. One specimen from England is known to be of this form (Yorkshire, 1885), and three other desert-wheatears have been obtained in Great Britain, but not critically examined. [F. C. R. J.]

ASIATIC DESERT-WHEATEAR [*Oenanthe*¹ *deserti albifrons* Brandt. Eastern desert-wheatear].

1. **Description.**—Resembles *S. deserti*, but is somewhat larger and darker. The female differs from the male in having the wings and tail lighter, brown areas replacing black. [W. P. P. and T. W.]

2. **Distribution.**—The breeding-grounds of the eastern race lie in the steppes and deserts of Central Asia, from the Southern Caucasus and the Kirghiz Steppes through East Persia to Zaidam, Dzungaria, Nan-Shan, Ala-Shan, and Tibet south of the Kuku-Nor to E. Baluchistan. On passage it visits Kashmir, Afghanistan, Baluchistan, and Asia Minor, and winters in India, South Arabia, Socotra, Nubia, and the White Nile. One British specimen at least (Orkneys, 1906) is known to belong to this race, and probably also those recorded from Heligoland. [F. C. R. J.]

PIED-WHEATEAR [*Oenanthe*¹ *pleschanka* (Lepechin)].

1. **Description.**—Differs from all the preceding species of Wheatear in having the mantle black. The sexes are unlike in coloration. Adult male, length 6 in. [153 mm.]. Head, nape, and hind-neck white, washed all over with brownish grey giving a soiled appearance; lores, chin, throat, sides of the neck and ear-coverts, as well as the wings and scapulars, black, slightly fringed with buff; rump and upper tail-coverts white; middle tail feathers black, white for the basal third; remainder of the tail feathers white, tipped with black, which colour extends half way up the outer web of the outermost tail feather; remainder of the under surface white, suffused with buff. Adult female marked as in the male, but the black replaced by brown, otherwise similar. [W. P. P. and T. W.]

2. **Distribution.**—From the Dobrogea in East Roumania through South Russia to the Crimea and Caucasia in Europe; in Asia it also breeds from Transcaspia, Turkestan, and Persia east through Afghanistan, Baluchistan, the North-West Provinces and Kashmir to West Tibet, Mongolia, North China, and South-eastern Siberia. Represented by a local race in Cyprus. On migration it has occurred in North-east Africa and Arabia, and has been met with as a casual

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on Heligoland, once on the Isle of May in Scotland (1909), in Italy, and apparently in Algeria. It is replaced by a local breeding form in Cyprus, which is also migratory. [F. C. R. J.]

BLACK-WHEATEAR [*Oenanthe*¹ *leucúra* (Gmelin). Blackchat. French, *traquet noir*; Italian, *monachella nera*].

1. **Description.**—Recognised by its almost entirely black plumage. The sexes differ in coloration, and the female is slightly smaller. Length 7 in. [178 mm.]. The deep brownish black hue of the plumage is relieved only by the upper and under tail-coverts, and the tail, which are white, but the middle pair of tail feathers have only the basal half white, and the terminal half black; the remainder is pure white, with a subterminal bar of black about a quarter of an inch wide at the tip, fringed with white; iris dark brown; bill and feet black. The female has the general colour of the upper and under parts smoke-brown, otherwise she resembles the male. [W. P. P. and T. W.]

2. **Distribution.**—The breeding-grounds of this chat are confined to the hilly districts of the Iberian Peninsula, the south of France, and the Italian Riviera. It appears also to breed in Sicily, and wanders occasionally to Italy. Two specimens have been obtained in England (Sussex, 1909), and one observed on Fair Island in 1912. In North-west Africa it is replaced by allied forms. [F. C. R. J.]

SIBERIAN-STONECHAT [*Saxicola*¹ *torquáta indica* (Blyth); *Pratincola maúra* (Pallas). Indian stonechat.

1. **Description.**—Distinguished from the stonechat by its darker upper surface and in having the upper tail-coverts uniform pure white. The sexes differ in coloration. Length 5 in. [127 mm.]. General colour of the upper parts of the body black, some of the feathers having dusky fringes; scapulars, outer webs of the secondaries, a patch on the sides of the neck, and the upper tail-coverts pure white; throat black; chest, upper breast, and sides of body uniform dark chesnut; middle of the belly and under tail-coverts white; axillaries white, black at the base; wings and tail black. In the female the general colour above is of a blackish brown, all the feathers fringed with rufous; upper tail-coverts white; wings and tail as in the male, but browner; under surface of the body chesnut-buff, excepting the under tail-coverts, which are white. [W. P. P. and T. W.]

2. **Distribution.**—The breeding-grounds of this race of stonechat lie mainly in Western Siberia from the Petschora valley and the Southern Urals eastward through Russian Turkestan, Transcaspia, Tian-Shan, Kashmir, and the Western Himalayas, apparently as far as Sikkim. Its chief winter quarters lie in India, but it has been once recorded from England (Norfolk, 1904). Over the greater part of Europe from Southern Sweden to the Mediterranean and North-west Africa, and also in the Caucasus, it is replaced by allied forms which winter in Africa. [F. C. R. J.]

LAPLAND-BLUETHROAT [*Cyanécula svécica svécica* (Linnæus). German, *Schwedisches* or *Tundra-Blaukehlchen*].

1. **Description.**—Distinguished from the whitespotted-bluethroat by having the middle of the throat light chesnut surrounded with blue. The sexes are unlike in coloration. Adult male, length 4½ in. [114 mm.]. Upper surface greyish brown, a well-defined white supercilium; cheeks, throat, and upper chest rich ultramarine-blue, with a wide transverse bar of

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reddish chesnut; remainder of the under surface yellowish white; tail chesnut for the basal half, black for the terminal half. The adult female is paler, with the under parts buffy white, with a blackish brown band across the chest. Some old females attain blue feathers on the throat. [W. P. P. and T. W.]

2. **Distribution.**—This race of bluethroat breeds in Sweden, Lapland, North Russia, and the tundra of West Siberia east to lat. 66° N. on the river Yenisei. It winters in North-east Africa and occasionally in Western India, visiting Eastern Europe and Transcaspia on migration. Has occurred once on the Isle of May, in September 1909. [F. C. R. J.]

WHITESPOTTED-BLUETHROAT [*Cyanécula svécica cyanécula* (Wolf); *Cyanécula wolfi* Brehm. French, *fauvette gorge-bleue*; German, *weiss-sterniges Blaukehlchen*; Italian, *pett'azzurro a macchia bianca*].

1. **Description.**—Differs from the redspotted-bluethroat only in having the chesnut patch on the throat replaced by one of silvery white. [W. P. P. and T. W.]

2. **Distribution.**—The breeding-grounds of this race are situated in Middle Europe, including France, the Low Countries, Germany, the Russian Baltic Provinces to St. Petersburg, Poland, and West Russia, Austro-Hungary, locally in Switzerland, and apparently in small numbers in North Italy. In South Russia and Central Asia it is replaced by allied forms. The main stream of migration passes through Western Europe (S. France, Italy, and the Iberian Peninsula) to North-west Africa, but some birds also migrate to North-east Africa. Seven males have been recorded from Great Britain (three Sussex, one Kent, one Yorks, and two from Fair Island). [F. C. R. J.]

NORTHERN-NIGHTINGALE [*Luscinia luscinia* (Linnæus). Thrush-nightingale. French, *rossignol progné*; German, *Sprosser*; Italian, *rusignolo maggiore*].

1. **Description.**—Differs chiefly from the common-nightingale in having a short first primary which does not reach to the end of the wing-coverts, whereas in the common-nightingale it reaches a quarter of an inch [6 mm.]. The sexes are alike in size and coloration. Length 6½ in. [165 mm.]. It is, however, larger than the common species, less rufous in colour, and has the sides of the throat and chest indistinctly and obscurely spotted. [W. P. P. and T. W.]

2. **Distribution.**—Breeds from the southern half of Sweden, Southern Finland and Denmark to the Baltic coasts of Germany and the eastern provinces of that country, Russia east to the Urals and south to the Crimea and Caucasus, Galizia and Transylvania, also locally in Roumania. In Asia its breeding range extends east to the Altai. Its winter quarters lie in East Africa, and it has been recorded south to German East Africa and the Zambesi. Casual in Western Europe, and has been recorded twice (or possibly three times) from Great Britain (Fair Island, 1911; Kent, 1904; and possibly Norfolk, 1845). [F. C. R. J.]

THE WARBLERS¹

[ORDER: *Passeriformes*. FAMILY: *Turdidæ*. SUBFAMILY: *Sylviniæ*]

[SIBERIAN-RUBYTHROAT [*Luscinia caliope* (Pallas)].—Is said to have been observed in October 1900 in Kent, but the evidence is inconclusive. It breeds in Siberia and North-eastern Asia, wintering in India, China, and the Philippines, and has occurred casually in S. France and Italy as well as in Russia. [F. C. R. J.]

SARDINIAN-WARBLER [*Sylvia melanocephala* (Gmelin). French, *fauvette melanocephale*; German, *schwarzköpfige Grasmücke*; Italian, *occhicotto*].

1. **Description.**—Resembles the blackcap in possessing a black head, but may be recognised from that species at a glance by its white throat and rounded black and white tail. The sexes are unlike in coloration. Length $5\frac{1}{2}$ in. [139 mm.]. General colour of the upper parts slate-grey shading into black on the head, neck, and ear-coverts; innermost secondaries broadly fringed with rufous; two middle pairs of tail feathers black, fringed for their entire length with slate-grey; remaining tail feathers tipped with white, the outermost pair having the terminal half white; under surface of the body white, shaded with greyish white on the chest and sides of the body. The adult female has the upper parts brownish slate, secondaries fringed with tawny buff; under parts white, washed with isabelline on the chest and sides of the body. [W. P. P. and T. W.]

2. **Distribution.**—In Europe this species breeds in S. France, the Iberian Peninsula, Balearic Isles, Corsica, Sardinia, Sicily, Malta, Italy, Dalmatia, Montenegro, Turkey, Greece, Crete, and the Archipelago. In Asia it is found in Asia Minor, but is replaced by an allied race in Syria. It also nests in North-west Africa (Marocco to Tripoli), but the race from the Western Canaries is distinct, though birds from the eastern islands do not differ from European specimens. The winter quarters of the species lie mainly in S. Algeria, Tunisia, and the Sahara, also in smaller numbers in Palestine and the Nile valley to Nubia. Definitely recorded once from England (Sussex, June 1907). [F. C. R. J.]

ORPHEAN-WARBLER [*Sylvia orphea* Temminck.¹ French, *fauvette orphée*; German, *Sängergrasmücke*, *Orpheussänger*; Italian, *bigia grossa*].

1. **Description.**—Differs from the Sardinian-warbler by its much larger size, and from the blackcap, which it closely resembles, by having the ear-coverts black like the head, whereas in the latter species the ear-coverts are whitish. The sexes differ in coloration. Length $6\frac{1}{2}$ in. [165 mm.]. The general colour of the male, as to the upper surface, is of a slate-grey; the head, including the ear-coverts, black—very sharply defined from the whitethroat; wings like the back in coloration; middle tail feathers black; next pairs black tipped with white, the outermost having the outer web white; under surface of body white, tinged on the chest with greyish buff and more strongly so on the sides of the body and flanks. The adult female has the upper parts brownish grey, the head a trifle darker and browner. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in North-west Africa from Marocco to Tripoli, and South-western Europe, including the Iberian Peninsula, the greater part of France, Switzerland, and in small numbers north to Luxemburg, Italy, and Sicily. From Dalmatia and Montenegro its range extends southward to Greece, and in Asia Minor, Palestine, Persia, Afghanistan, and Turkestan it is replaced by an allied race. The winter quarters of the western form lie in Africa, probably in the Sahara or the tropical west; while the eastern form ranges south to Somaliland, Arabia, and India. Four specimens have been taken in England (two Sussex, one each Middlesex and Yorks), where there is a suspicion that it may have bred. [F. C. R. J.]

BARRED-WARBLER [*Sylvia nisoria* (Bechstein). French, *babillarde épervière*; German, *Sperbergrasmücke*; Italian, *bigia padovana*].

1. **Description.**—Has the upper and under tail-coverts barred, and the bastard primary extremely short and not reaching to the end of the coverts. The sexes are alike, except that the female is browner and less barred below. Length 6 in. [153 mm.]. Upper surface leaden grey; lower back, rump, upper tail-coverts, and scapulars tipped with white, giving

¹ Strictly *Sylvia hortensis* (Gmelin), but this name has for many years been used for the garden-warbler.

these parts a barred appearance; primaries and secondaries smoke-brown, narrowly fringed on the outer web with white; tail like the back in colour, tipped and margined on the outer web with white; under surface of the body, including the sides and flanks, white, subterminally barred with crescentic bands of dark grey; iris pale yellow; bill dark horn, yellowish at the base of the lower mandible; legs horn-colour. The young birds lack the barring, and are grey above and white below; breast and flanks tinged with greyish buff. [W. P. P. and T. W.]

2. **Distribution.**—Widely distributed in the breeding season in Europe, from Southern Sweden and the south shore of the Gulf of Finland east to the Urals and south to the Black Sea, as well as in Denmark, Germany, Austro-Hungary, North Italy, Roumania, Bulgaria, Montenegro, and Dalmatia. In Asia east to the Tian Shan it is replaced by a closely allied form. The winter quarters of the European race lie in North-east Africa. In the British Isles nearly fifty occurrences are on record, of which only three are from Ireland. [F. C. R. J.]

SUBALPINE-WARBLER [*Sylvia cantillans* Pallas; *Sylvia subalpina* Bonelli. French *babillarde subalpine*; German, *weissbartige Strauchsänger*; Italian, *sterpazzolina*].

1. **Description.**—Has the chin, throat, and upper chest reddish chesnut. The sexes differ in coloration. Length 5 in. [127 mm.]. The male has the upper surface of the body, sides of the face and lores bluish grey; wings blackish brown with lighter margins; tail blackish brown, the outermost pair for the greater part white, the second and third outermost pairs with an elongated patch of white at the tip, a clearly defined white moustached streak; iris brown; eyelids reddish; legs and toes brown. The female has the upper parts sandy brown and the under surface white, tinged with light buff on the chest and sides of the body; wings and tail as in the male. [W. P. P. and T. W.]

2. **Distribution.**—The western form of this species breeds in Sardinia and Corsica, locally in Italy, Sicily, the Riviera, Spain, and Portugal. In the Eastern Mediterranean and in North-west Africa it is replaced by allied races. As a rule it is sedentary or only subject to local movements, and it is extraordinary that specimens should have been obtained on St. Kilda (June 1894) and Fair Island (May 1908). [F. C. R. J.]

YELLOWBROWED-WARBLER [*Phyllóscopus superciliosus* (Gmelin)]. German, *Gelbbrauniger Laubsänger*].

1. **Description.**—Distinguished by having a double bar of white across the wings. The sexes are alike, except that the female is a trifle duller. Length 4 in. [102 mm.]. Head, back, and scapulars greenish olive, becoming brighter on the rump and upper tail-coverts; primaries and secondaries ash-brown, margined on the outer web with yellowish olive; greater and median wing-coverts tipped with yellowish white, forming a double wing-bar; tail feathers ash-brown, margined on the outer web with yellowish olive, a well-defined superciliary stripe of golden yellow; cheeks yellow-olive, shaded with darker olive; chin, throat, chest, and belly white, tinged with yellow, darkest on the sides of the body and flanks; iris dark brown; bill dark brown; legs light brown. The adults after the autumn moult have the upper parts brighter and greener, and the superciliary stripe and wing-bars much deeper yellow. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in Siberia from the Ob valley east to the Sea of Okhotsk and north almost to the tundra bordering on the Arctic Ocean. Southward its breeding range extends to Lake Baikal, Transbaikalia, Ussuria, etc. Its principal winter quarters lie in S. China, Burma, Assam, and Bengal, but it frequently wanders to Europe, and has been recorded from the British Isles (about sixty), Heligoland (eighty), Holland, Italy, Austria, and Germany, as well as Russia. It is replaced by an allied race on the Tian Shan, Himalayas, etc., which winters in India. [F. C. R. J.]

PALLAS' WILLOW-WARBLER [*Phyllóscopus prorégulus* (Pallas). German, *Goldhähnchen-Laubsänger*].

1. **Description.**—Recognised by a double wing-bar and a broad and well-defined golden yellow streak down the middle of the crown. The sexes are alike, excepting that the female is slightly duller in coloration. Length 3½ in. [95 mm.]. General colour of the upper surface olive-green, darkest on the head, a broad band down the middle of the head, a wide eyebrow and a streak below the eye golden yellow; rump primrose-yellow; primary flight-feathers blackish brown, margined on the outer web with olive-yellow; greater and median wing-coverts widely tipped with golden yellow, forming two conspicuous wing-bars; cheeks and sides of the face bright yellow; under surface white, suffused with yellow, especially on the chin, sides of the body, and under tail-coverts; axillaries and under wing-coverts yellow. [w. p. p. and t. w.]

2. **Distribution.**—Breeds in Siberia from the Lena to the Pacific Ocean and south to the Stanovoi Mountains, while a closely allied race nests in the mountain forests of the Himalayas from Hazara and Kashmir to Butan. The greater part of this species migrates to South China, but some have been recorded from Orenburg (Russia), Heligoland, Dalmatia, and once in England (Norfolk, October 1896). [F. C. R. J.]

GREENISH WILLOW-WARBLER [*Phyllóscopus viridánus* Blyth].

1. **Description.**—Recognised by having only one wing-bar. The sexes are alike in coloration, except that the female is duller. Length 4 in. [102 mm.]. General colour of the upper parts greenish olive, slightly paler on the rump, a well-marked pale yellow eyebrow stripe; wings blackish brown, bordered on the outer web with yellow, the greater coverts being tipped with yellowish white, forming a wing-bar; tail ash-brown, narrowly edged with yellow on the outer web. General colour of the under surface white, washed with yellow; axillaries, under wing-coverts, and thighs primrose-yellow. The third, fourth, and fifth primaries longest, and the second primary is intermediate in length between the seventh and eighth. [w. p. p. and t. w.]

2. **Distribution.**—This species is known to breed in the Russian Baltic Provinces (and probably also in North-east Russia), as well as from Central Russia to Western Siberia as far as the Altai range, parts of Northern Turkestan, and possibly even to Gilgit and Kashmir. It is replaced by other races in East Siberia, and from the Caucasus to Afghanistan. The normal winter quarters lie in the Indian Peninsula, but the eastern race winters in Pegu, the Malay Peninsula, Cochin China, etc. It has occurred three times on Heligoland and once in England (Lincs., September 1896). [F. C. R. J.]

SIBERIAN-CHIFFCHAFF [*Phyllóscopus collybita tristis* Blyth. German, *sibirischer Laubsänger*].

1. **Description.**—Differs from the above in having no yellow on the under parts, excepting on the axillaries. Length 5 in. [127 mm.]. General colour above ash-brown, suffused with yellow, especially on the rump, an indistinct dull yellowish white eyebrow stripe; wings ash-brown, slightly margined on the outer web with yellowish green; tail similar to the wings; general colour of the under surface white, tinged with buff, especially on the sides of the face and sides of the body; the third and fourth primaries are the longest; second primary equal to the seventh or slightly shorter. [w. p. p. and t. w.]

2. **Distribution.**—In Europe this race is only known to breed in North-east Russia from the Petschora delta eastward, and south to the Middle Ural range. In Asia its breeding range extends from Orenburg through Western Siberia and the Altai range east to Lake Baikal. In winter it migrates through Turkestan to Mesopotamia and the northern part of India. Has

been obtained on Heligoland, and occurs regularly in small numbers in autumn on Fair Island, and occasionally in other parts of Scotland. [F. C. R. J.]

SCANDINAVIAN-CHIFFCHAFF [*Phyllóscopus collybita abietinus* (Nilsson)].

1. **Description.**—Resembles the common-chiffchaff, but is slightly larger and a little paler in coloration, the wing measuring 58 mm. against 55 of the common-chiffchaff. [w. P. P. and T. W.]

2. **Distribution.**—The breeding limits of this race are imperfectly known at present, but it apparently breeds in Scandinavia, probably over a considerable part of Eastern Germany, Austro-Hungary, Bosnia and Montenegro, and Russia south to the Caucasus and north to about lat. 65°. Its chief winter quarters lie in South-eastern Europe, Asia Minor, Transcaucasia, and North-east Africa, but it seems to occur occasionally in West Europe, and has once been recorded from the Isle of Wight (April 1907) and regularly from Fair Island on both passages. [F. C. R. J.]

EVERSMANN'S WARBLER [*Phyllóscopus borealis* (Blasius). German, *nordischer Laubsänger*].

1. **Description.**—Differs from the above-mentioned species in having two wing-bars. Length $4\frac{1}{4}$ in. [112 mm.]. General colour of the upper parts dull olive-green, a well-defined eyebrow of yellowish white extending to the back of the head; median and greater wing-coverts tipped with greyish white, forming two wing-bars; wings and tail ash-brown, narrowly margined with olive-green; under surface of the body white, suffused with pale yellow, darkest on the breast and sides of the body; axillaries and under wing-coverts pale yellow; the third and fourth primary are longest, second primary intermediate in length between the fifth and sixth. [W. P. P. and T. W.]

2. **Distribution.**—This species is confined in Europe during the breeding season to a small district of Norway (Finmark) and Northern Russia, including the Kola Peninsula, the Archangel government, the Petschora valley, and the northern part of the Perm government. In Asia it ranges through Siberia east to Kamtschatka, Corea, and Ussuria. It migrates through Japan and China, wintering in the Malay Peninsula and part of the Malay Archipelago as far as Flores, Sumba, and the S. Moluccas. Has occurred twice in Scotland (Sule Skerry, Orkneys, September 1902, and Fair Island, September 1908). [F. C. R. J.]

[AMERICAN RUBY-CROWNED-KINGLET [*Régulus caléndula* (Linnaeus)].—Two are said to have been shot in Scotland, but the records are not sufficiently authenticated for insertion in the British list. [F. C. R. J.]]

RUFOUS-WARBLER [*Agrobates galactótes galactótes* (Temminck); *Aëdon galactódes* (Temminck). German, *rostfarbiger Sänger*; Italian, *rusignolo d'Africa*].

1. **Description.**—Recognised by the chesnut-coloured tail, barred at the tip with white and black. The sexes are alike in size and coloration. Length $6\frac{1}{2}$ in. [165 mm.]. General colour of the upper surface of the body rich sandy buff, a well-defined white eyebrow reaching from the nostrils to the hinder part of the crown; lores blackish brown; primaries and secondaries ash-brown, margined on the outer web with greyish buff; tail feathers rich chesnut, broadly barred at the tip with white and submarginally with black; under surface of the body buffish white, darkest on the chest and sides of the body; axillaries and under wing-coverts brownish buff; legs, feet, and claws horn colour. [W. P. P. and T. W.]

2. **Distribution.**—The western race of this species breeds in North Africa from Morocco to Egypt, and also in Palestine and the Iberian Peninsula, but chiefly in the south and east of the latter. It is migratory and visits the Sahara, but its winter quarters are not known, though

probably it stays in some of the oases. It occurs in Italy from time to time, and has been recorded three times from England (Devon two and Sussex one) and once from Ireland. In Asia Minor and the Balkan Peninsula it is replaced by an allied form, and other races are met with in East Africa and West Asia. [F. C. R. J.]

BROWNBACED-WARBLER [*Agrobates galactotes syriacus* (Hemprich and Ehrenberg). German, *oestlicher Heckensanger*; Italian, *rusignolo levantino*].

1. **Description.**—Closely resembles the above, but the upper parts are greyish brown instead of chestnut, and the middle tail feathers are coloured like the back. Length $6\frac{1}{2}$ in. [165 mm.]. General colour of the upper surface of the body, including the middle pair of tail feathers, greyish brown; primaries and secondaries greyish brown, narrowly margined with whitish; a well-marked white eyebrow, reaching from the lores to the nape; under surface of the body greyish white, darkest on the chest and sides of the body; axillaries and under wing-coverts pale isabelline; upper mandible brown, lower mandible horn-colour; legs, feet, and claw horn-colour. [W. P. P. and T. W.]

2. **Distribution.**—This race inhabits the Balkan Peninsula from South Dalmatia and South Herzegovina to Greece, the Ionian Isles, and the islands of the Archipelago. In Asia it is also found in Asia Minor, and from the Lebanon northward in Syria. It winters in South Arabia, North Somaliland, and occasionally in East Africa. It has been recorded from Italy, and twice from England (Kent, 1907; Sussex, 1910). [F. C. R. J.]

RADDE'S BUSH-WARBLER [*Herbivócula schwärzi* (Radde); *Lusciníola schwärzi* (Radde)].

1. **Description.**—Distinguished by its long first (outermost) primary, which is half as long as the penultimate long primary. The sexes are alike in coloration. Length 5 in. [127 mm.]. General colour of the upper parts olive-brown, purer olive on the lower back and rump; a well-marked yellow eyebrow from the lores to the nape; wings and tail ash-brown, margined on the outer web with olive-green; under surface of the body yellowish white, most strongly marked on the chest and sides of the body; under tail-coverts yellowish buff; axillaries and under wing-coverts yellowish buff; legs, feet, and claws pale horn-colour. After the autumn moult the upper parts become tawny olive, and the under parts are more or less suffused with tawny buff. [W. P. P. and T. W.]

2. **Distribution.**—This species breeds from Kultuk on Lake Baikal to Ussuria and the island of Saghalien, but there is some evidence that it is also found in the nesting season farther westward (between Irkutsk and Tomsk). It winters in South China, Pegu, and Tenasserim, and has once been recorded from England (Lincs., October 1898). [F. C. R. J.]

ICTERINE-WARBLER [*Hypolais icterina* (Vieillot). French, *bec fin à poitrine jaune*; German, *Gartenspötter*; Italian, *canapino maggiore*].

1. **Description.**—Recognised by its yellow upper and under parts. The sexes are alike except that the female is rather less brightly coloured. Length $5\frac{1}{2}$ in. [139 mm.]. Upper surface of the body dull olive-yellow; wings and tail ash-brown, margined on the outer web with olive-yellow; lores, feathers round the eye, and the entire under parts pale primrose-yellow, darkest on the sides of the body; axillaries and under wing-coverts yellowish white; the third primary longest, the second primary intermediate between the fourth and fifth. After the autumn moult the olive-yellow of the upper parts is slightly greyer, and the under surface paler. [W. P. P. and T. W.]

2. **Distribution.**—Generally distributed over the greater part of the European continent in the breeding season, except in Norway beyond lat. $67\frac{1}{2}^{\circ}$, Sweden north of about lat. 63° , and Northern Finland and Russia from about 57° in the Urals. It becomes scarce in South Russia,

and is absent from the Balkan Peninsula south of Bulgaria, the north-west and west of France, and the Iberian Peninsula. It probably also breeds in North-west Africa, and either this or the next species has bred occasionally in the south of England. Its winter quarters lie in Tropical Africa, and over twenty specimens have been obtained in the British Isles, fourteen from the south and east coasts of England, ten from Fair Island and Lerwick, and one from Ireland.

4. Nest and Eggs.—The usual site for the nest is in the fork of a shrub or hedge, between four and eight feet from the ground, occasionally much higher, and in a tree. It is neatly built of down, grasses, wool, etc., interwoven with bark strips, fibre, and other materials, and lined with grasses, roots, and hair, with sometimes a few feathers. The eggs are usually 4 or 5, sometimes 6 in number, and have a dull rosy ground, sparingly spotted and streaked with black. Average size of 142 eggs, $.72 \times .52$ in. [18.3×13.4 mm.]. Incubation is performed by both sexes, the male sitting in the afternoon (Naumann), and lasts 13 days. In Middle Europe eggs can be found from the end of May to mid-June, and in Scandinavia during the latter half of June. Probably only one brood is reared in the season as a rule. [F. C. R. J.]

MELODIOUS-WARBLER [*Hypolais polyglotta* (Vieillot). Polyglot-warbler, melodious willow-warbler. French, *fauvette polyglotte*; German, *Sänger-Laubvogel*; Italian, *canapino*].

1. Description.—Resembles the icterine-warbler in size and coloration, but may be distinguished from that species by the size and length of the bastard primary, which is more than half an inch long, and extends for more than half its length beyond the primary coverts, whereas in the icterine-warbler it is shorter than the primary coverts by a quarter of an inch. The second primary generally intermediate in length between the sixth and seventh. [W. P. P. and T. W.]

2. Distribution.—There is reason to believe that this species has bred occasionally in the south of England (Sussex, Surrey, etc.), but owing to the difficulty of distinguishing it from the preceding species, the evidence is not wholly satisfactory. On the Continent its range is much more restricted, and it is only known to breed in France (excepting only the north-eastern departments), and locally on the west side of Italy, as well as in Spain and Portugal, except north of the Cantabrian Mountains. It also nests in North-west Africa from Tunisia to Morocco as far as the Rio de Oro. Its winter quarters lie in western Tropical Africa (Senegambia and Upper Guinea), and it has been recorded from Belgium, Heligoland, and Austro-Hungary, as well as four times at least from England and Ireland (Sussex two, Cornwall, and Co. Cork). [F. C. R. J.]

4. Nest and Eggs.—The nest is generally built in the fork of some bush, from three to five feet from the ground, and is neatly and compactly built of dead grasses and vegetable down, with a dead leaf or so woven in, and is lined with down and a few roots, hairs, or feathers. The eggs are 4 or 5, rarely 6 in number, generally rather a deeper rose-red than those of the icterine, dull in texture, and spotted and streaked with black. Average size of 100 eggs, $.69 \times .51$ in. [17.7×13.2 mm.]. Details as to incubation seem to be lacking, but the period probably differs little from that of the icterine. In Spain the eggs may be found from mid-May onward as a rule, and apparently two broods are reared, as fresh eggs may be found about the third week of June. [F. C. R. J.]

GREAT REED-WARBLER [*Acrocephalus arundinaceus* (Linnæus). French, *rousserolle*; German, *Drosselrohrsänger*, *grosser Rohrspatz*; Italian, *cannareccione*].

1. Description.—Recognised by its very large size. Length $7\frac{1}{2}$ in. [190 mm.]. Sexes alike. General colour of the upper surface rufous brown, becoming paler on the rump and upper tail-coverts; primaries, secondaries, and tail feathers blackish brown, margined on the outer web with

olive-brown; a narrow eyebrow of yellowish white from the lores to behind the eye; chin and throat pale yellowish white; breast, sides of the body, thighs, under wing-coverts and axillaries yellowish buff; upper mandible blackish brown; under mandible, legs, and feet horn-colour; second primary equal to the third, which is the longest. [W. P. P. and T. W.]

2. Distribution.—This species breeds on the Continent in suitable localities south of the Baltic and the Gulf of Finland, and about lat. 57° in the Urals, but is scarce in Denmark. Southward its range extends to the Mediterranean, and it is known to breed in North-west Africa, but it is not known to nest in Corsica and Sardinia or in the south of the Balkan Peninsula. In Asia it nests in Asia Minor, Palestine, and West Siberia. In winter it migrates to Africa, where it has been met with as far south as Loango, the Transvaal, and Natal, passing through Persia and S. Arabia on migration, and has been recorded about ten times from England. In Eastern Asia it is replaced by allied forms. [F. C. R. J.]

BLYTH'S REED-WARBLER [*Acrocephalus dumetorum*, Blyth].

1. Description.—Distinguished from the great reed-warbler by its much smaller size. Length 5 in. [127 mm.]. Sexes alike. General colour of the upper surface of the body dull olive-brown; wings and tail blackish brown, margined on the outer web with olive-green; an ill-defined whitish eyebrow; throat whitish, gradually merging into the yellowish buff of the chest and sides of the body; middle of the belly and abdomen whitish buff; axillaries and under wing-coverts yellowish buff; third and fourth primaries equal and longest; second primary shorter than the fifth. After the autumn moult the whole of the under parts are suffused with buff. [W. P. P. and T. W.]

2. Distribution.—In Europe this species is only known to breed in Russia, north probably to Archangel, west to St. Petersburg, and south to Novgorod, Tver, Moscow and Tula, and east to Orenburg. In Asia it is widely distributed, and breeds in W. Siberia, Transcaspia, Turkestan, Bokhara, the Altai range, and the Himalayas. Its normal winter quarters lie in India south to Ceylon and Pegu, and seven specimens have been recorded from England and Scotland (Yorks. one, Holy Island one, and five or six from Fair Island). [F. C. R. J.]

CETTI'S WARBLER [*Cettia cetti* (Marmora). French, *bouscarle*; German, *Cetti's Rohrsänger*; Italian, *rusignolo di fiumi*].

1. Description.—Recognised by having only ten feathers in its tail. Sexes alike, excepting that the female is slightly smaller. Length 5 in. [127 mm.]. General colour of the upper surface of the body reddish brown, brightest on the rump; a whitish eyebrow, extending from the base of the bill to behind the eye; wings and tail blackish brown, margined on the outer web by reddish brown; chin, throat, middle of breast, and abdomen white; sides of the head and sides of the chest and body reddish brown; under tail-coverts reddish brown, fringed with whitish. [W. P. P. and T. W.]

2. Distribution.—Resident in the Iberian Peninsula, the Balearic Isles, South France, Corsica, Sardinia, Sicily, Italy (except in the north), the Balkan Peninsula north to Dalmatia and Roumania, the Archipelago, Crete, Cyprus, Asia Minor, Palestine, and probably also in South Russia. It also breeds in North-west Africa (Marocco to Algeria), but from the Kirghiz Steppes, Turkestan, and Transcaspia to Eastern Persia it is replaced by an allied race, which is also found wintering in India. Has twice been recorded from England (Sussex, 1904 and 1906). [F. C. R. J.]

PALLAS'S GRASSHOPPER-WARBLER [*Locustella certhiōla* (Pallas)].

1. Description.—Recognised by its striped upper plumage and by the black and white tips to the tail. Sexes alike. Length 6½ in. [165 mm.]. General colour of the upper surface of

the body reddish brown, heavily streaked on the head, neck, and mantle with brownish black; rump unspotted; primaries and secondaries lighter than the back; tail reddish brown, obscurely banded with black; tips of tail white, submarginally banded with blackish brown; under surface of the body whitish, strongly washed with buff on the chest, sides of the body, thighs, and under tail-coverts. [W. P. P. and T. W.]

2. Distribution.—This species breeds in Siberia from the Tomsk government and the Yenisei to the Altai range, and east to the river Amur, Ussuria, and the Pacific Ocean. Its winter quarters lie in India south to Ceylon and the Andamans, Burma, the Great Sunda Isles, and the Natuna group. It has once been recorded from Heligoland and once from Ireland, (Rockabill Light, Co. Dublin, 28th September 1908). [F. C. R. J.]

TEMMINCK'S GRASSHOPPER-WARBLER [*Locustella lanceolata* (Temminck). Lanceolated-warbler].

1. Description.—Distinguished by having both the upper and under parts streaked and the tail uniform. Sexes alike. Length $5\frac{1}{2}$ in. [140 mm.]. General coloration of the upper parts reddish brown, each feather having a large blackish brown spot, producing a streaked appearance; wings and tail greyish brown, margined on the outer web with olive-brown; under surface of the body whitish, streaked especially on the chest and sides of the body with blackish brown; sides of the body and under tail-coverts washed with buff. [W. P. P. and T. W.]

2. Distribution.—Only recorded in Europe as breeding from the Onega river in North Russia, by Meves, up to the present, but has probably been overlooked. In Asia Johansen has recently recorded it from the Tomsk government, and from Kultuk it breeds east to Kamtschatka, and on the Kuriles, North Yezo, and Saghalien. On migration it occurs in Japan and China, wintering in India, Burma, the Andaman Isles, Hainan, Borneo. Has been recorded once from Dalmatia, once from Heligoland, and three times from Great Britain (Lincs. 1909, Fair Island 1908, and Orkneys 1910), all on autumn migration. [F. C. R. J.]

THE ACCENTORS¹

[ORDER: *Passeriformes*. FAMILY: *Accentoridæ*]

ALPINE-ACCENTOR [*Accentor collaris* (Scopoli); *Prunella collaris* (Scopoli). French, *fauvette des Alpes*; German, *Alpenbraunelle*; Italian, *sordone*].

1. Description.—Distinguished from the common-hedgessparrow (vol. ii. p. 95) by its larger size and its spotted throat and tail. Length $6\frac{1}{2}$ in. [165 mm.]. Sexes alike. General colour of the upper parts whitish grey, all the feathers having a broad brownish black shaft-stripe, producing a streaked appearance; primaries brownish ash; secondaries similarly coloured but marked on the outer web with whitish; coverts brownish black, tipped with white on their outer webs; throat white, each feather narrowly barred at the tip with black; remainder of the under parts ash-grey; sides of the breast, belly, and flanks chesnut, margined with grey; under tail-coverts brownish black, broadly margined with white; iris brown; bill blackish brown, yellowish at the base; legs and feet cinnamon-brown; claws black. [W. P. P. and T. W.]

2. Distribution.—This species breeds in the Alpine zone of the great mountain ranges of Central and South-western Europe, above the tree limit, from the Iberian Peninsula and the Pyrenees to the Alps, Corsica, probably also Sardinia, the Apennines, Sicily, the Carpathians, and the Riesengebirge. In the Balkan Peninsula, Caucasus, and Asia Minor, as well as in various parts of temperate Asia, it is replaced by allied races. Though not strictly migratory, it descends to lower elevations in the winter, and wanders to some extent. As a casual visitor it has been recorded from Belgium, Heligoland, and about twenty times in Great Britain,

¹ Vol. ii. p. 95.

chiefly from the southern counties of England, once from Wales, and once from Scotland (Fair Island). [F. C. R. J.]

THE TITS¹

[ORDER: *Passeriformes*. FAMILY: *Paridae*]

NORTHERN LONGTAILED-TIT [*Ægithalus caudatus caudatus* (Linnæus). Whiteheaded, longtailed-tit. German, *weissköpfige Schwanzmeise*; Italian, *codona capo bianco*].

1. **Description.**—Distinguished from the British longtailed-tit by its longer tail and by having the under parts less brightly coloured. Sexes alike. Length 6 in. [152 mm.]. Whole of the head snow-white, with hidden black bases to the feathers; mantle black, bordered with pinkish red; feathers of the lower back and rump very long and dense, rose-pink in colour, with black bases; the tail, which is longer than the body, is black, the two outer pairs having the outer web and part of the inner web at the tip white; under surface of the body white, slightly tinged with rose-pink, becoming darker on the sides of the body and under tail-coverts; wings black, margined with white on the inner web; secondaries black, widely margined on the inner and more narrowly on the outer web with white; inner secondaries white, with a black shaft; under wing-coverts white. [W. P. P. and T. W.]

2. **Distribution.**—This race is confined during the breeding season to Northern and Eastern Europe, including Scandinavia, Russia (except in the Caucasus and Crimea), and Eastern Germany. In Asia its range extends across the Continent to North Japan (Yezo) and the Kuriles. Other local forms are found in West Europe, the Mediterranean, the Balkan Peninsula, South Russia, and in Asia. In winter birds from the high north move southward, and others in districts farther south become vagrants and stray to Central and Western Europe (West Germany, Belgium, France), and once or twice in England (Northumberland, 1852, and perhaps Kent). [F. C. R. J.]

CONTINENTAL COAL-TIT [*Parus ater ater* Linnæus. French, *mésange noire*; German, *Tannenmeise*; Italian, *cincia mora*].

1. **Description.**—Distinguished from the British subspecies, *Parus ater britannicus*, by its pure bluish grey back, by the greater amount of white on the cheeks, and by the paler coloration of the flanks and sides of the body, these parts being light buff instead of russet coloured. The size is similar to that of the latter, and the sexes are alike. [W. P. P. and T. W.]

2. **Distribution.**—This race is distributed in the breeding season over the greater part of the European continent north to about 65°, but is replaced by allied forms in the Caucasus and Crimea and in the Mediterranean islands, as well as in North-west Africa. In Southern Europe, especially in the Iberian and Italian Peninsulas and in Sicily, it is confined to the mountain ranges. In Asia its breeding range extends across Siberia to Kamtschatka, but in the Tian Shan, Himalayas, China, and Japan it is replaced by allied races. In Southern Europe it is resident, but northern birds move southward during the winter, and two specimens have been definitely recorded from England, both from Norfolk, 1866. [F. C. R. J.]

NORTHERN WILLOW-TIT [*Parus atricapillus borealis* Selys. German, *nordische mattköpfige Sumpfmehse*].

1. **Description.**—Differs from the marsh-titmouse in having the head deep black almost devoid of gloss, and the black of the head prolonged on to the mantle; the upper parts, moreover, are lighter in colour; the under parts are likewise lighter in tint, and the tail is more rounded, the outermost pair of feathers being appreciably shorter than the second pair. Sexes similar both in size and coloration. Length 4½ inches [111 mm.]. [W. P. P. and T. W.]

¹ Vol. ii. p. 171.

2. Distribution.—This race breeds in Scandinavia, Finland, and North Russia, the Baltic Provinces, and locally in East Prussia. During the winter months it becomes a vagrant, and has been recorded from Orenburg, Poland, and once (Gloucester, March 1907), if not twice, in England. Allied forms of this species are found in Central Europe and across Asia to Japan. [F. C. R. J.]

SCANDINAVIAN CRESTED-TIT [*Parus cristatus cristatus* Linnæus. Northern crested-tit. German, *nordische Haubenmeise*].

1. Description.—Closely resembles the Scottish form, *Parus cristatus scoticus*, but is slightly paler above and has much less black on the throat, the black patch being confined to a broad band down the middle of the throat and not extending on to the sides of the throat; the sides of the body are paler, and the white edges to the feathers of the head are a trifle broader and of a pure white. Sexes alike in size and coloration. Length $4\frac{1}{2}$ inches [111 mm.] [W. P. P. and T. W.]

2. Distribution.—This race breeds in Scandinavia, Northern Russia south to Poland and the central governments, probably also in the Carpathians and in East Prussia. It has occurred as a vagrant in the Caucasus, and one specimen has been definitely identified from England (Yorks, March 1872), while other probable occurrences are recorded. [F. C. R. J.]

CENTRAL EUROPEAN CRESTED-TIT [*Parus cristatus mitratus* Brehm. French, *mésange huppée*; German, *mitteleuropäische Haubenmeise*; Italian, *cincia col ciuffo*].

1. Description.—Closely resembles the Scandinavian form, but is most rufescent on the upper part of the body. The size is the same. Feathers of the head black, widely margined with white, those on the back of the head prolonged, forming a crest; region of the ear black; mantle reddish brown; wings and tail rufescent brown, brightest on the rump; chin, middle of the throat, and fore-neck black; under parts white, washed on the side with light buff. [W. P. P. and T. W.]

2. Distribution.—This form of crested-tit breeds in Western and Southern Europe from the south of Spain and North Portugal through France, Holland, Belgium, West Germany, Jylland, Switzerland, and Austro-Hungary to the Balkan Peninsula. Like the other tits it becomes vagrant after the breeding season, and has then occurred in Italy south of the Alps, and once in the south of England (Yarmouth, Isle of Wight, prior to 1844). The birds from the Iberian Peninsula may form a separate race. [F. C. R. J.]

THE SHRIKES¹

[ORDER: *Passeriformes*. FAMILY: *Laniidae*]

SOUTHERN GREY-SHRIKE [*Lanius excubitor meridionalis* Temminck. French, *pie-grièche méridionale*; Italian, *averla meridionale*].

1. Description.—Recognised by its grey head (like the remainder of the upper part) and its pink under parts. Sexes alike. Length 10 in. [254 mm.]. General colour of the upper parts leaden grey, darkest on the head and lightest on the rump and upper tail-coverts; middle pairs of tail feathers black, tipped with white; outer tail feathers white on the outer webs and largely so on the inner webs towards the tip; primaries and secondaries black, white at the base and at the tip; feathers at the extreme base of the bill white, continued in a line over the eyes; lores and ear-coverts jet-black; throat and sides of the neck white, gradually merging into the pink of the remainder of the under parts; under tail-coverts white. [W. P. P. and T. W.]

2. Distribution.—This form of great grey-shrike breeds in the Iberian Peninsula commonly, and also in the south of France. As a casual visitor it has been recorded from many localities

¹ Vol. ii. p. 237.

in France, north to the Loire, and in the maritime provinces of North-western Italy south to Rome. One specimen has been recorded from the south of England (Sussex, January 1911). [F. C. R. J.]

LESSER GREY-SHRIKE [*Lanius minor* Gmelin. French, *pie-grièche d'Italie*; German, *kleiner Grauwürger* or *Würger*; Italian, *averla cenerina*].

1. **Description.**—Recognised by its deep black frontal bar, which is continued in a very broad band through the eyes to the ear-coverts, and its grey upper parts. Sexes alike, except that the female is less brightly coloured and the black frontal band is not so clearly defined. Length 8 in. [203 mm.]. General colour of the upper surface light bluish grey, darkest on the head and lightest on the rump; a broad black band across the forehead reaching behind the eyes and continued from the lores to the ear-coverts; primaries black on their terminal half and white on their basal half; secondaries black tipped with white; middle tail feathers black; outer pairs white with black shafts, and with a small black rounded patch on the inner web; chin and middle of the belly white; remainder of the under surface delicate rose-pink. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in Central and Southern Europe west to France, but not in the north, sporadically in Germany and Italy, in great numbers in Austro-Hungary and the Balkan states, also in Mid and South Russia north to the Russian Baltic Provinces and Livonia. In Asia it breeds from Asia Minor, Persia, and W. Turkestan to the Altai. On migration it occurs in Holland and Belgium, and has been recorded about sixteen times from England, chiefly from the southern counties in autumn. Its normal winter quarters lie in Africa, where it ranges south to German East Africa, the Orange River Colony, Transvaal, Angola, and British East Africa. [F. C. R. J.]

WOODCHAT-SHRIKE [*Lanius senator senator* Linnæus; *Lanius pomeranus* Sparrman. French, *pie-grièche rousse*; German, *rotköpfiger Würger*; Italian, *averla capirossa*].

1. **Description.**—Recognised by its red crown and nape. Sexes alike, excepting that the female is not so brightly coloured. Length $7\frac{1}{2}$ in. [190 mm.]. Adult male, top of the head and back of the neck reddish chesnut; a frontal band of black submarginally banded with white; mantle and lower back black; rump and upper tail-coverts white; wings black, fringed on their outer webs with rusty and on their inner webs with whitish; middle pairs of tail feathers black; remaining pairs white at the base and at the tip; middle portions black; scapulars white; under surface of the body white, washed on the flanks with rust-colour. [W. P. P. and T. W.]

2. **Distribution.**—This species is chiefly confined to the Mediterranean subregion, and is plentiful in North-west Africa from Morocco to Tripoli, and the Iberian Peninsula. In France, the Low Countries, Germany, Switzerland, and Austro-Hungary it is local and not common, but is more numerous in Italy, Sicily, the Balkan Peninsula, South Russia, the Caucasus, and Asia Minor. In Corsica and Sardinia, as well as in Palestine to Persia, it is replaced by allied races. In winter it migrates through North Africa to the tropical west coast districts; while the eastern race winters in East Africa and Arabia. Over forty occurrences are on record from the British Isles, mostly from the southern and south-eastern counties of England, once from Scotland, and once Ireland. [F. C. R. J.]

4. **Nest and Eggs.**—As there is reason to believe that this species has occasionally bred with us in the Isle of Wight, and possibly also in Hampshire, the following particulars are given. The nesting site in mid-Europe is generally among the branches of a tree some twelve or fifteen feet from the ground, but in Spain it often nests in bushes. Flowering plants are much used in the construction of the neatly built nest, which is lined with wool, fine grasses, feathers, or hair as a rule. The eggs are 5 or 6, sometimes 7 in number, pale greenish or less commonly brownish yellow or creamy in ground-colour and only rarely pink, zoned at the big end with

grey-brown spots and underlying shellmarks. Average size of 100 eggs, $\cdot 89 \times \cdot 66$ in. [22.8×16.9 mm.]. Incubation is said to last 14 to 16 days, and is apparently chiefly performed by the hen, the cock relieving her in the morning. Nests may be found in Spain from April 20 onward, but chiefly in May, and probably only one brood is reared in the season. [F. C. R. J.]

CORSICAN-WOODCHAT [*Lanius sardator badius* Hartlaub. Sardinian-woodchat].

1. **Description.**—Closely resembles the continental form of the woodchat described above, but is easily recognised by the white bases to the feathers of the wing and by the broader black frontal band. The sexes differ in the same way as the last mentioned. Length 7 in. [178 mm.]. [W. P. P. and T. W.]

2. **Distribution.**—This race breeds in Corsica and Sardinia commonly, and migrates through Algeria and the Sahara to the coast of West Africa, from the Gold Coast to the Niger. Possibly an occasional bird may remain to breed in Algeria, as one was obtained near Lambèse on May 5 (Hartert). Has occurred once in the south of England, at Romney Marsh, Kent, June 1909. [F. C. R. J.]

MASKED-SHRIKE [*Lanius nubicus* Lichtenstein. Nubian-shrike].

1. **Description.**—Recognised by the white forepart of its head and its black back. The sexes are different in coloration. Length 7 in. [178 mm.]. Adult male—hinder part of the head black; rump and middle pairs of tail feathers black, glossed with blue, outer pairs white with black shafts; forepart of head white, extending in a line over the eyes; scapulars white; primaries black on their terminal half and black on their basal half; secondaries black, margined on the inner web with white; throat white, extending on to the sides of the neck; chest and sides of the body and thighs light chesnut, darkest on the latter; middle of the belly, under tail-coverts, and axillaries white. The female is similar to the male, but all the black parts of that sex are brownish black. [W. P. P. and T. W.]

2. **Distribution.**—Formerly this species bred in Greece, but now it is apparently extinct there. It nests commonly in Asia Minor, and also in Cyprus, Palestine, and South-west Persia. In winter it migrates to South Arabia and East Africa, from Egypt, Nubia, to Fashoda and Lake Rudolf, and has once been recorded from south of England, at Woodchurch, Kent, July 1905. [F. C. R. J.]

[SOUTH AFRICAN-BULBUL [*Pycnonotus capensis*].—Is said to have been shot near Waterford, Ireland, in 1838; was no doubt an escaped bird. [F. C. R. J.]]

THE FLYCATCHERS¹

[ORDER: *Passeriformes*. FAMILY: *Muscicapidæ*]

COLLARED-FLYCATCHER [*Muscicapa collaris* Bechstein. French, *gobe-mouche à collier*; German, *Halsband-Fliegenschnäpper*; Italian, *pigliamoche a collare bianco*].

1. **Description.**—Resembles the pied-flycatcher, but differs in having a ring of white feathers round the neck. The sexes are dissimilar. Length 5 in. [127 mm.]. Adult male—hinder part of the head, cheeks, ear-coverts, mantle, back, and tail black; base of the forehead and a ring round the hind-neck white; primaries and secondaries black, white on their basal half; the whole of the under surface, including the axillaries, pure white. The adult female differs from the male in being brown instead of black above, and the sides of the face, cheeks, throat, breast, and sides of the body ochraceous brown, shading into white on the middle of the belly and under tail-coverts. [W. P. P. and T. W.]

¹ Vol. ii. p. 261.

2. **Distribution.**—Somewhat sporadically distributed over Central Europe: Gotland, rare in France, the Low Countries, Germany, Switzerland, Italy, more general in Austro-Hungary, and Southern Russia. On migration it passes through Persia, Asia Minor, and Palestine, as well as Greece, to Egypt, Tripoli, and Tunisia, but its range farther south is as yet undetermined, though probably it winters in tropical Africa. Two specimens have occurred in England, both in Sussex, May 1911. [F. C. R. J.]

REDBREASTED-FLYCATCHER [*Muscicapa parva* Bechstein. French, *gobe-mouche rougedâtre*; German, *Zwerg-Fliegenschnäpper*; Italian, *piglia-mosche pettirosso*].

1. **Description.**—The male may be recognised by its reddish chesnut throat and chest: the female recalls the female spotted flycatcher, but differs in being much smaller and in lacking striations on the under surface. Length 5 in. [127 mm.]. Adult male—general colour of the upper parts brownish ash; forehead, sides of the face, and ear-coverts grey; eye encircled by white feathers; primaries and secondaries like the back; middle pair of tail feathers brownish black, remaining pairs white excepting the terminal third, which is ash-brown; chin, throat, and upper breast reddish chesnut, fading off into reddish buff on the sides of the body; middle of the belly whitish. The adult female has the upper surface and tail similar to that of the male, but the throat, chest, and sides of the body are white, washed with yellowish buff, and the abdomen and under tail-coverts white. [w. p. p. and t. w.]

2. **Distribution.**—The breeding range of this species in Europe extends from the Baltic Provinces and the Olonetz government in Russia southward to Central Russia and the Caucasus; in Germany and Austro-Hungary it breeds sporadically; Rügen, and it is said Denmark, and possibly South Sweden, are also within its breeding range. In Asia it also breeds in West Siberia. On migration it has occurred in Italy and Greece, as well as in Sweden, Heligoland, Holland, and over thirty times in the British Isles (eleven have been obtained in Norfolk alone); but it is only known at present to winter in Western India, though, as it has been observed in Egypt, some probably winter in Africa. [F. C. R. J.]

BROWN-FLYCATCHER [*Muscicapa latirostris* Raffles].

1. **Description.**—Resembles the spotted-flycatcher (see vol. ii. p. 261), but lacks the streaks on the throat and head. The sexes are alike in size and coloration. Length 5½ in. [140 mm.]. General colour above uniform ash-brown, slightly paler on the rump and upper tail-coverts; lesser wing-coverts like the back; median and greater coverts ash-brown, margined on the outer web with reddish brown; lores whitish; sides of the face and ear-coverts like the back, but slightly paler; under parts white, washed with brownish ash on the chest and sides of the body. [w. p. p. and t. w.]

2. **Distribution.**—Breeds in East Siberia from Lake Baikal to Corea, and North China eastward and south to the Himalaya range as far west as Chamba, and apparently also in India occasionally. It also breeds in Japan. On migration it visits India and Ceylon, the Malay Peninsula, Andaman Isles, Hainan, South China, the Philippines, and Great Sunda Isles. Has once been recorded from the south of England, near Lydd, Kent, May 1909. [F. C. R. J.]

THE SWALLOWS¹

[ORDER: *Passeriformes*. FAMILY: *Hirundinidæ*]

REDRUMPED-SWALLOW [*Chelidon rufula* (Temminck); *Hirundo rufula* Temminck].

1. **Description.**—Differs greatly from the common species (*H. rustica*, see vol. ii. p. 277), more particularly in having the rump reddish buff and in lacking the chesnut on the forehead.

¹ Vol. ii. p. 277.

The sexes are alike, excepting that the female is rather duller. Length $7\frac{1}{2}$ in. [190 mm.]. Adult—general colour above, including the wings and tail, black, strongly glossed with steel-blue; feathers at the extreme base of the culmen chesnut, continued into a narrow line over each eye, and widening out on the back of the head where it unites; rump light chesnut-buff; longer upper tail-coverts black; whole of the under parts light buff, with indistinct black shaft-streaks; under tail-coverts black. [W. P. P. and T. W.]

2. **Distribution.**—The only certainly known European breeding-place of this species is in Greece, but it also nests in other parts of the Mediterranean region, the Maroccan Atlas, W. Algeria, Cyprus, Asia Minor, and Palestine. Eastward its breeding range in Asia extends through Persia to Afghanistan, Baluchistan, Turkestan, and Gilgit, but in India and Eastern Asia to Japan it is replaced by allied races. On migration it is not rare in Italy and Sicily, and also appears in Algeria, Tunisia, and Egypt, wintering in Africa (White Nile, Abyssinia, etc.). Has occurred as a casual on Heligoland, in South France, while two have been obtained and two others seen in Great Britain (one Kent, 1909; one shot and two seen Fair Island, 1906). East Asiatic forms winter in South-eastern Asia and the Malayan Archipelago. [F. C. R. J.]

[AMERICAN PURPLE-MARTIN [*Prógne subis* (Linnæus)].—Is said to have occurred once in Ireland in 1840, but probably the record is due to an escaped bird, if genuine. [F. C. R. J.]

[AMERICAN TREE-SWALLOW [*Tachycinéta bicolor* (Vieillot)].—General colour of the upper surface glossy oil green, slightly bluer on the rump and upper tail-coverts; wings and tail black, slightly glossed with blue; under surface pure white, smoky on the sides and flanks; axillaries smoke-brown. Said to have been killed at Derby in 1850. [F. C. R. J.]

THE WOODPECKERS¹

[ORDER: *Coraciiformes*. FAMILY: *Picidae*]

[GREAT BLACK-WOODPECKER [*Dryocopus martius martius* (Linnæus)].

1. **Description.**—Recognised by its very large size and by having the tarsus entirely feathered. The sexes are alike, except that the female has the red on the head confined to the occiput, where it forms a triangular patch, generally tapering to a point on the nape. Length 18 in. [457 mm.]. Adult male—forehead, crown, and middle of occiput crimson, with black bases to the feathers; remainder of the upper and the whole of the under parts deep black, glossed on the sides of the head and neck with blue-black. [W. P. P. and T. W.]

2. **Distribution.**—Has frequently been reported from England, and J. E. Harting actually quotes thirty-three such records in his *Manual* (2nd edit., p. 394). Nearly all these have been conclusively disproved, and some recent records are known to be due to birds imported and set free. [F. C. R. J.]

[AMERICAN HAIRY-WOODPECKER [*Dryobates villosus* (Linnæus)].—Said to have been killed in Yorkshire. [F. C. R. J.]

[AMERICAN DOWNY-WOODPECKER [*Dryobates pubescens* (Linnæus)].—Said to have been shot in Dorset (1836) and elsewhere. [F. C. R. J.]

[GOLDENWINGED-WOODPECKER or FLICKER [*Colaptes auratus* (Linnæus)].—Said to have been killed in Wilts (1836). If genuine, these records were probably due to imported birds. [F. C. R. J.]

[THREETOED-WOODPECKER [*Picoides tridactylus* (Linnæus)].—Is said (by Donovan) to have been shot in Scotland, but there is no proof of the truth of this statement. [F. C. R. J.]

¹ Vol. ii. p. 318.

THE SWIFTS¹[ORDER: *Coraciiformes*. FAMILY: *Cypselidæ*]

ALPINE-SWIFT [*Apus melba* (Linnæus); *Cypselus melba* (Linnæus). Whitebellied-swift. French, *martinet à ventre blanc*; German, *Alpensegler*; Italian, *rondine di mare*].

1. **Description.**—Distinguished by its very large size and by having the throat and belly white, interrupted by a broad prepectoral band of brown. The sexes are alike in coloration. Length from the bill to the end of the wing, 11 in. [279 mm.]. Whole of the upper surface hair brown, with a slight greenish gloss; each feather fringed with whitish, more pronounced on the tail; the wings (9 inches in length) are similar in colour to the back; tail feathers acuminate and forked, the middle pair being 1 inch shorter than the outermost pair; chin and middle of the throat white; lores, sides of the throat and the fore-neck similar in colour to the upper parts; under wing, and tail-coverts blackish brown, fringed with whitish. [W. P. P. and T. W.]

2. **Distribution.**—This species breeds in the Mediterranean region, from North-west Africa through Spain and Portugal to the Pyrenees, Switzerland, and the Alpine district, Italy, the Balkan Peninsula, all the larger islands of the Mediterranean, Asia Minor, the Crimea and Caucasus, and from Persia and Transcaspia through Turkestan to the Himalayas and the mountains of Southern India. It is replaced by an allied form in Tropical Africa. The winter quarters of European birds are apparently in Tropical Africa, while Himalayan birds probably winter in South India and Ceylon. As a casual visitor this species has occurred in Germany, Heligoland, Denmark, and thirty times in the British Isles, chiefly in the south of England. [F. C. R. J.]

NEEDLETAILED-SWIFT [*Chaetura caudacuta* (Latham); *Acanthyllis caudacuta* (Latham)].

1. **Description.**—Cannot be confounded with any other swift, both on account of its size and by the prolongation of the shafts of the tail feathers, which project beyond the tail in the form of stiff spines. The sexes are alike, except that the female is less clearly marked. Length from the tip of the bill to the end of the wing, 11 in. [279 mm.]. Adult—top of the head black, glossed with green; mantle and middle of the back smoky brown; wing and tail black, very strongly glossed with bluish green; secondaries black, glossed with green on the outer web, white on the inner web; whole of the throat pure white, sharply defined from the dark smoke-brown chest and belly; under tail-coverts white. [W. P. P. and T. W.]

2. **Distribution.**—The breeding-grounds of this species lie in Eastern Siberia, from Lake Baikal, the Lena valley, and Irkutsk eastward, and in Mongolia, Manchuria, as well as on the islands of Saghalien and Japan. Its winter quarters are in Australia and Tasmania, and two specimens have been obtained in England (Essex, July 1846, and Hants, July 1879). In the Himalayas it is replaced by an allied race. [F. C. R. J.]

THE NIGHTJARS²[ORDER: *Coraciiformes*. FAMILY: *Caprimulgidæ*]

REDNECKED-NIGHTJAR [*Caprimulgus ruficollis* Temminck. French, *engoulevent à collier roux*; German, *Rothals-Ziegenmelker*; Italian, *succiapapre dal collo rosso*].

1. **Description.**—Resembles the common-nightjar (*Caprimulgus europæus*), but differs chiefly in that the sexes do not differ, both male and female having white spots on the wings

¹ Vol. ii. p. 350.² Vol. ii. p. 362.

and tail, and further in the well-marked golden buff ring of feathers round the hind-neck. [W. P. P. and T. W.]

2. Distribution.—This species breeds in the Western Mediterranean region, but the form which is admitted to the British list is not that which inhabits the Iberian Peninsula and Marocco (*C. ruficollis ruficollis*), but the race which breeds in Algeria and Tunisia (*C. ruficollis desertorum*), and apparently winters in the Sahara. It has occurred once in England, near Newcastle, October 5, 1856. [F. C. R. J.]

EGYPTIAN-NIGHTJAR [*Caprimulgus ægyptius* Lichtenstein. German, *ägyptischer Tag-schläfer*; Italian, *succiacapre algerino*].

1. Description.—Distinguished from other species of nightjars by its paler coloration and the absence of white spots on the wings and tail. Sexes alike. Length 10 in. [254 mm.]. General colour above sandy buff, minutely freckled all over with black, and with black and buff arrowhead markings; primaries brownish black, irregularly barred on the outer web with buff, and very boldly toothed with white on the inner web; all the feathers tipped with greyish buff, freckled with black; under surface of the body sandy buff, finely barred and minutely freckled with black; a spot of white on each side of the neck. [W. P. P. and T. W.]

2. Distribution.—The breeding range of this species embraces Turkestan, Afghanistan, Baluchistan, East Persia, Mesopotamia, and apparently also Egypt, while it is represented by an allied race in North Africa from the Nile westward, through the Libyan desert and the Sahara to South Tunisia and S. Algeria. It is partly migratory, and probably the Turkestan birds winter in Egypt. Has occurred as a casual visitor in Malta, Sicily, Heligoland, and once in England, at Rainworth, Notts, June 23, 1883. [F. C. R. J.]

THE OWLS¹

[ORDER: *Coraciiformes*. FAMILY: *Strigidae*]

DARKBREASTED BARN-OWL [*Strix flammea guttata* Brehm; *Tyto alba guttata* (Brehm). Continental or Danish barn-owl. German, *Schleiereule*].

1. Description.—Differs from the barn-owl (*Strix flammea*, see vol. ii. page 379) in that the whole of the under parts are suffused with rich buff, and the spots on the chest and flanks are more pronounced. [W. P. P. and T. W.]

2. Distribution.—This race of barn-owl breeds in Southern Sweden, Denmark, Germany, except on the western border, where it interbreeds with the white-breasted form, Austro-Hungary, and southward to the Alpine range. It is sedentary over a great part of its range, but is probably an irregular migrant in the north, and at least thirteen occurrences are on record from the east and south-east coasts of England, while many other records probably refer to this form. [F. C. R. J.]

TENGMALM'S OWL [*Egolius tengmalmi* (Gmelin); *Nyctala tengmalmi* (Gmelin). French, *chouette Tengmalm*; German, *Tengmalm's-Kauz*; Italian, *civetta capogrosso*].

1. Description.—Recognised by its small size, by the absence of ear-tufts, and the toes which are feathered down to the claws. Sexes alike, except that the female is a little larger. Length 10 in. [254 mm.]. General colour above, including the wings, dull chocolate-brown, thickly mottled all over with white, especially on the forehead, where the markings take more the form of white ovals; tail similarly coloured, but with five narrow crossbars of white;

¹ Vol. ii. p. 379.

under surface similar to the upper surface, but with the white markings preponderating. [W. P. P. and T. W.]

2. **Distribution.**—This species breeds in the forests of Northern and Middle Europe, from lat. 68° in Scandinavia and lat. 59° in North Russia south to the Pyrenees, the Alpine chain, the mountains of Montenegro and Bulgaria, but in the southern part of its range it is only found in mountain systems. In Asia it breeds from Russia eastward to the Yenisei. It is replaced by allied races in the Caucasus, North-east Siberia, and North America. Northern birds are subject to migratory movements, and about twenty-four occurrences have been recorded from Great Britain (twelve of which are from Yorks). [F. C. R. J.]

EUROPEAN HAWK-OWL [*Súrnia ulúla ulúla* (Linnæus); *Súrnia funérea* (Linnæus)
German, *Sperbereule*].

1. **Description.**—Recognised by its long pointed tail. Sexes alike. Length 14½ in. [368 mm.]. Head slate-black, barred and spotted with white; back, wings, and tail dark brown, with broad bars on white; scapulars largely white; sides of the face white, a large longitudinal bar of black behind the ear-coverts; middle of throat blackish brown, sides of throat white; remainder of the under surface, including the under wing-coverts and axillaries, white, regularly barred with black. [W. P. P. and T. W.]

2. **Distribution.**—Confined in Europe during the breeding season to Northern Scandinavia, south to Wernland in Sweden, Finland, and North Russia from about 67° 66' in the Urals south to Livonia (rare), and the Smolensk, Kazan, and Perm governments. In Asia it apparently breeds in Siberia east to Tobolsk, but is replaced in other parts of Asia as well as in North America by allied forms. Three occurrences at least of this race in Great Britain (one Wilts and two Scotland) are definitely assigned to this race, which is partially migratory and vagrant after the breeding season. [F. C. R. J.]

AMERICAN HAWK-OWL [*Súrnia ulúla caparoch* (Müller)].

1. **Description.**—Resembles the European form, but is darker and more strongly barred with black. [W. P. P. and T. W.]

2. **Distribution.**—This race breeds in the northern parts of North America, from Alaska and Hudson's Strait south to southern British Columbia, Alberta, Montana, and Ungava. It is said to have occurred four times in Great Britain (one Cornwall, one Somerset, and two Clyde area), but these may be due to importation. In North America it migrates in winter south to Washington, Nebraska, Indiana, Ohio, New York, Massachusetts, and Maine. [F. C. R. J.]

SCOPS-OWL [*Ótus scóps* (Linnæus); *Scóps giú* (Scopoli). French, *petit duc*; German, *Zwergohreule*; Italian, *assiolo*].

1. **Description.**—Recognised by its small size. The sexes are alike, excepting that the female is larger than the male. Adult male, length 7½ in. [191 mm.]. General colour above grey washed with buff, marked with white especially on the head, and with black shaft-streaks; wings ash-brown, with large truncate spots of white on the outer web, and toothed on the inner web with white; tail grey, freckled with black and barred with whitish buff; under surface of the body similar to the upper parts but lighter, and with the black shafts to the feathers more pronounced. [W. P. P. and T. W.]

2. **Distribution.**—This species breeds in the Mediterranean region from Lanzarote in the Canaries to North-west Africa (Marocco to Tunisia and N. Sahara), and Southern Europe (north to S. France, the Alpine range, South Germany in small numbers, Austro-Hungary, and South Russia). It also breeds in the Mediterranean islands and Asia Minor, but in Cyprus and in Asia and parts of Africa it is replaced by allied races, which are as yet imperfectly known. It

is migratory, European birds wintering in Africa, and has been recorded about fifty or sixty times from the British Isles. [F. C. R. J.]

EAGLE-OWL [*Búbo búbo* (Linnæus); *Búbo ignávus* T. Forster. French, *grand duc*; German, *Uhu*; Italian, *gufo reale*].

1. **Description**.—Recognised by its large size. Length 28 in. [711 mm.]. Sexes alike. General colour above brownish black, mottled and freckled with tawny buff; ear-tufts very long (about $3\frac{3}{4}$ in. [95 mm.]) and black; primaries dark brown, barred with buff and freckled with brownish black; lores and region of eye white; under parts tawny buff, heavily streaked on the chest, and regularly barred over the remainder of the under parts with black. [w. p. p. and t. w.]

2. **Distribution**.—On the Continent the breeding range of this species extends to beyond the Arctic Circle in Scandinavia, and in Russia up to the limits of forest growth. From these limits southward it is found in suitable localities south to the Pyrenees and the Mediterranean, but in the Iberian Peninsula and South-east Russia it is replaced by allied races, and this is also the case in Northern Africa and Asia, from Asia Minor, Palestine, and Transcaspia eastward to Japan. In winter northern birds are to some extent migratory, and there are a good many records from Great Britain, some of which are no doubt due to escapes from captivity. [F. C. R. J.]

THE ROLLERS¹

[ORDER: *Coraciiformes*. FAMILY: *Coraciidæ*]

[ABYSSINIAN-ROLLER [*Coracias abyssinicus*].—Two are said to have been obtained near Glasgow about 1857. Cannot yet be added to the British list. [F. C. R. J.]]

[INDIAN-ROLLER [*Coracias benghalensis*].—Stated to have been shot in Lincolnshire in 1883. Cannot yet be added to the British list. [F. C. R. J.]]

THE BEE-EATERS

[ORDER: *Coraciiformes*. FAMILY: *Meropidæ*]

BEE-EATER [*Mérops apiáster* Linnæus. French, *guépier vulgaire*; German, *europäischer Bienenfresser*; Italian, *gruccione*].

1. **Description**.—Identified by its golden yellow throat and blue under parts. The sexes are the same, excepting that the female is duller in coloration. Adult male, length 11 in. [279 mm.]. Base of the forehead white, tinged with green; head, mantle, back, and primary coverts deep chesnut, darkest on the head; scapulars greenish yellow, washed with chesnut; primaries dark blue, margined on the inner webs with ash-grey; secondaries chesnut, broadly barred at the tip with black; tail green, shaded with blue on the inner web; throat golden yellow, separated from the dark greenish blue under parts by a black collar; lores and ear-coverts black. [w. p. p. and t. w.]

2. **Distribution**.—In Europe the breeding range of this species includes the Mediterranean islands, the Iberian Peninsula, South France, Italy, the Balkan Peninsula, locally in Hungary, Transylvania, and South-east Galizia, as well as South Russia. It also breeds in Africa north of the Sahara, and in Asia in Transcaspia, Turkestan, and West Siberia, as well as from Palestine and Asia Minor to Kashmir. Its winter quarters are in South and Tropical Africa, where it has been met with, and is said to breed, in Cape Colony, while Asiatic birds winter in North-west India. Exceptionally it has bred in S. Germany, and as a casual it has occurred in Lapland,

¹ Vol. ii. p. 422.

North Russia, Scandinavia, and Denmark, while about seventy have appeared in the British Isles, and it occurs in most of the countries of Central Europe. [F. C. R. J.]

[BLUETAILED-BEE-EATER [*Mérops philippinus*].—Is said to have been once obtained near Seaton Carew in 1862, but the evidence is not conclusive. [F. C. R. J.]]

[BELTED-KINGFISHER [*Ceryle alcyon* (Linnaeus)].—Is said to have been twice obtained in Ireland, but though this species has occurred in Iceland, Holland, and the Azores, the circumstances connected with the Irish records in 1845 are open to grave suspicion, and at present it cannot be admitted to the British list. [F. C. R. J.]]

THE CUCKOOS¹

[ORDER: *Cuculiformes*. FAMILY: *Cuculidae*]

GREAT SPOTTED-CUCKOO [*Clamator glandarius* (Linnaeus); *Coccyzus glandarius* (Linnaeus). French, *cocou-geai*; German, *Häher-Kuckuck*; Italian, *cuculo dal ciuffo*].

1. **Description.**—Recognised by its large size and white spotted upper parts. The sexes differ in coloration. Length 16 in. [406 mm.]. Top of the head furnished with a long, full black crest, minutely tipped with white; back, rump, scapulars, secondaries, and wing-coverts dark ash-brown with a dull greenish bronze lustre, the wing-coverts and scapulars being spotted at the extremity with white; primaries light chesnut, tipped with white and with a submarginal band of dark ash-brown; tail feathers like the back, broadly tipped with white; under parts white, washed on the throat with light chesnut. The female is duller in coloration, and has the outer margins of the primary quills uniform in colour with the back, i.e. not chesnut as in the male. [W. P. P. and T. W.]

2. **Distribution.**—The breeding range of this species is a wide one, for it is known to breed both in North and South Africa, as well as in South Europe and South-west Asia. In Europe it is chiefly confined in the breeding season to Spain and Portugal, though it occurs not unfrequently on passage in Italy, but has not been proved to breed there or in Greece. It breeds in Cyprus, and also from Asia Minor and Palestine east to Persia, and in Africa from Egypt to Morocco in the north through Somaliland to Cape Colony in S. Africa. As a straggler it has been recorded from Bulgaria, Dalmatia, Germany, and four times from the British Isles (two Irish records, one Northumberland and one Norfolk). [F. C. R. J.]

YELLOWBILLED-CUCKOO [*Coccyzus americanus* (Linnaeus)].

1. **Description.**—Readily distinguished by its yellow under mandible, its grey upper parts and white belly, and the large area of chesnut on the wings. Sexes alike. Length 11 in. [279 mm.]. General colour above brownish grey slightly glossed with olive; wings like the back, but rich chesnut on the outer web; the tail, which is long, has the middle pair of feathers like the back, remaining pair black tipped with white, the outer pair having the outer web for the most part white; under surface of the body white, tinged on the chest with grey; upper mandible black, lower mandible bright yellow. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in southern North America, and migrates through the West Indies and Central America to South America. Has occurred about twelve times in the British Isles (chiefly in the south-western counties of England and Wales, one Scotland and two Ireland), and also in Italy, Belgium, and France. [F. C. R. J.]

¹ Vol. ii. p. 458.

BLACKBILLED-CUCKOO [*Coccyzus erythrophthalmus* (Wilson)].

1. **Description.**—Recognised by its black bill and yellowish buff under parts. Sexes alike. Length 10 in. [254 mm.]. Adult head dark slate-blue; mantle, back, and wings greyish brown, slightly glossed with olive; lores and ear-coverts black; middle tail feathers like the back; remaining pairs black, broadly tipped with white; under surface of the body rich golden buff; iris grey; bill black; feet lead-colour. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in eastern North America from South-east Alberta, S. Manitoba, and South Quebec to Arkansas, North Carolina, and Georgia, wintering in South America. Has occurred as a casual in the Azores, Italy, and once in Ireland (Antrim, September 25, 1871). [F. C. R. J.]

PIGEONS¹

[ORDER: *Charadriiformes*. FAMILY: *Columbidae*]

EASTERN TURTLE-DOVE [*Turtur orientalis* (Latham); *Streptopelia orientalis* (Latham) Asiatic Turtle-Dove].

1. **Description.**—Distinguished from the common turtle-dove (*Turtur turtur*, see vol. ii. p. 505) by having the under tail-coverts and tips of the tail grey instead of pure white, and by its much larger size. The sexes are alike in size and coloration. Length 12 in. [305 mm.]. The upper parts are of a dull smoky brown, fringed on the scapulars with rufous buff, giving a scalelike appearance, and on the rump with dark leaden grey, a large patch of black and grey feathers on each side of the neck. The plumage of the under parts is vinous buff, darker across the lower throat. Middle tail feathers smoky brown, remainder black, broadly tipped with grey; the iris is reddish brown; skin round eye, tarsi, and feet red. The immature bird is very similarly coloured, but lacks the black and grey spot on the side of the neck. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in Central India and throughout China and Formosa to Manchuria, Corea, Ussuria, Saghalien, and Japan. Replaced in South-west Siberia and Turkestan to Kashmir by an allied race. Birds from N.E. Asia winter in China and Malaya. As a casual this species has occurred in Sweden, Denmark, and once in England (Yorkshire, in October 1889). [F. C. R. J.]

[AMERICAN PASSENGER-PIGEON [*Ectopistes migratorius* (Linnæus)].—Is said to have been obtained on five occasions in the British Isles, but probably the specimens had escaped from captivity. Only one bird is known to survive in captivity, and in a wild state the bird is now extinct. [F. C. R. J.]

THE AUKS²

[ORDER: *Charadriiformes*. FAMILY: *Alcidae*]

BRUNNICH'S GUILLEMOT [*Úria lomvia* (Linnæus); *Úria bruennichi* Sabine. French, *guillemot Brunnich*; German, *dickschnabelige Lummie*].

1. **Description.**—Differs from the common guillemot in its more massive beak, and by having the basal part of the cutting edge of the upper mandible bare. Length 18 in. [457 mm.]. The adult in summer plumage has the entire upper parts, including the head, neck, and wings, glossy greyish black, secondaries tipped with white; chin, throat, sides of the head and neck rich velvety dark brown, shading into the greyish black of the crown; remainder of the under parts pure white; iris brown; bill black; basal half of the cutting edge of the upper mandible

¹ Vol. ii. p. 499.

² Vol. iii. p. 1.

plumbeous; legs and feet black. The adult in winter plumage lacks the rich velvety dark brown chin and throat, these parts, like the remainder of the under parts, the sides of the face, auricular region, and sides of the occiput being white; the upper parts are slightly greyer than in summer. The young bird is coloured as in the adult in summer dress. The nestling has the upper parts dusky, beautifully patterned on the head with long downy feathers, black at the base and creamy white at the extremity; back similarly marked, but the light markings are more fulvous; remainder of the under parts pure white; iris in the adult brown. [W. P. P. and T. W.]

2. Distribution.—This is an Arctic species, breeding in Iceland, the Spitsbergen group and Franz Josef Land, along the Murman coast and in great numbers on Novaya Zemlya. Off the coast of Asia it breeds at the mouth of the Khatanga, the New Siberian Isles, Bennett and Wrangel Isles, and the Tchukchi Peninsula (Buturlin); while in North America it breeds in Northern Greenland, Hudson Strait, the Labrador coast, and the Magdalen Isles in the Gulf of St. Lawrence. In the North Pacific, Bering Sea, and Eastern Siberia it is replaced by an allied race. Though migratory, this species never wanders far south in winter, and is only a rare visitor to the North Sea and English Channel, having been recorded about a dozen times in Great Britain, chiefly along the east coast; but has occurred in Russia as a casual far inland and also in N. France. In North America it occasionally ranges south to South Carolina, Ohio, Indiana, and Iowa. [F. C. R. J.]

THE TERNS¹

[ORDER: *Charadriiformes*. FAMILY: *Laridae*. SUBFAMILY: *Sterninae*]

WHITEWINGED BLACK-TERN [*Hydrochelidon leucóptera* (Temminck); *Hydrochelidon leucóptera* (Schinz). French, *hirondelle de mer leucoptère*; German, *weissflügelige Seeschwalbe*; Italian, *mignattino ali-bianche*].

1. Description.—Distinguished in summer plumage from the other members of the genus by the pure white tail. Length 10 in. [254 mm.]. In the summer dress the whole of the head, back, rump, and all the under surface of the body, as well as the axillaries and under wing-coverts, deep glossy black; the region of the wrist, and the marginal coverts of the fore-arm as well as the inner primaries shining silvery white, the three outer primaries black, dusted with silver, shaft of the feathers ivory white; under tail-coverts and tail, which is but slightly forked, snow-white; iris dark brown; bill livid red; legs and feet vermilion. The adult in winter has the upper parts, including the wings and tail, light grey, a white collar round the back of the neck, the feathers of the back of the head and nape black, edged with white, the forehead and under surface of the body as well as the axillaries pure white. The young in down is of a rich fawn colour, with large median and lateral patches of black on the back and on the crown. The under parts are of a uniform brownish white. The webs of the feet are much indented in this species. [W. P. P. and T. W.]

2. Distribution.—Somewhat irregularly and sporadically distributed on the Continent, chiefly in the south-east, and thence across Asia to China. It is said to have nested in France, and apparently a few pairs breed in Sicily and Italy: it has nested in Bavaria, and does so in some numbers in Hungary as well as in Galizia and Bulgaria. In South Russia it is more plentiful, breeding north to Esthonia and lat. 58½°. In Asia it breeds in Siberia up to about lat. 53°-55°, south to Khiva and Turkestan, eastward to Dauria, Amuria, and perhaps Kamtschatka (Buturlin). Breeding in North Africa requires confirmation. It winters in Africa, where it has been met with south to the Transvaal, Orange River Colony and Damaraland, and Southern Asia, as well as visiting the Malay Archipelago, Australia, and

¹ Vol. iii. p. 55.

New Zealand. It occasionally visits Sweden, Denmark, and has occurred at least twenty or thirty times in the British Isles, and has been recorded from Barbados and Wisconsin. [F. C. R. J.]

WHISKERED-TERN [*Hydrochelidon leucoparæia* (Temminck); *Hydrochelidon hybrida* (Pallas). French, *hirondelle de mer moustac*; German, *weissbärtige Seeschwalbe*; Italian, *mignattino bigio*].

1. **Description.**—Distinguished in its summer plumage from the other species of the genus by the blood-red bill and the white chin and sides of the face. Length 12 in. [305 mm.]. Top of the head and back of the neck deep glossy blue-black; mantle, back, wings, and tail light grey; chin, throat, sides of the neck and upper chest white, merging into the dark slate-grey colour of the lower breast and belly, which is often quite black; under wing-coverts, axillaries, under tail-coverts, and under surface of tail white; iris brown; bill blood-red; feet vermilion. After the autumn moult the top of the head is black fringed with white, behind the eye is a large patch of black, while the under surface of the body is pure white. The young in down have the feathers at the base of the bill black, the upper parts of a rich fawn colour mottled with black—*i.e.* a scattered patch on the occiput, continued in a line down the head, a line down each side of the back, and patches on the wings; under surface pure white, except the chin and throat, which are black, sharply defined from the white chest and belly. [W. P. P. and T. W.]

2. **Distribution.**—This species breeds in Northern Africa, from Morocco to Tunisia and perhaps also Egypt; also in Spain, Portugal, S. France; occasionally in Bavaria and Bohemia; in Hungary and the Danube valley; as well as in South Russia north to Poland and about lat. 52°. In Asia it is said to breed in Palestine, and does so from Caucasia and Transcaspia east to Turkestan, and from Kashmir to China, but in Australia is replaced by an allied race. In Africa it ranges south to the Cape Colony in winter, and Asiatic birds winter in Southern Asia and the Malay Archipelago. In the British Isles it has occurred about fourteen times, and has been recorded from Barbados. [F. C. R. J.]

GULLBILLED-TERN [*Sterna nilótica* Gmelin; *Sterna anglica* Montagu. French, *sterne hansel*; German, *Lachseeschwalbe*; Italian, *rondine di mare gambe nere*].

1. **Description.**—Readily distinguished by its heavy black beak and comparatively long, black legs, which are longer than the middle toe and claw. Length 15 in. [381 mm.]. The adult in its nuptial dress has the top of the head and back of the neck deep black, glossed with blue; mantle, back, wings, and tail pearl-grey; entire under surface of the body pure white; iris hazel; bill and legs black. After the autumn moult the head and back of the neck are white streaked with black. The young in down has the upper parts yellowish buff, streaked and mottled with brownish black; under parts white, legs and feet yellow. [W. P. P. and T. W.]

2. **Distribution.**—In Europe local in the breeding season, but nests in Jylland, the Camargue in France, the Marismas of S. Spain, in Bavaria and Hungary (at one breeding-place only in each country), Greece, and by the coasts of the Black, Azov, and Caspian Seas, and north to the Central Urals in Russia. Formerly bred on Rügen and Schleswig. In Asia it nests in Asia Minor, Transcaspia, Turkestan, Persia, the Punjab, and across temperate Asia to Ussuria and Mongolia. In North Africa it breeds in Tunisia, and possibly also in Algeria and Morocco. In North America it nests on the Atlantic coast from New Jersey to Texas, as well as in S. America, but Australian birds belong to an allied race. European birds winter in Tropical Africa, and Asiatic birds range south to the Persian Gulf, India, Ceylon, Malaya, and the Malay Archipelago. In America it has been recorded south to Patagonia. In England about twenty-five occurrences are on record, none of them very recent, with the exception of one from the Pentland Skerries, May 7, 1913. [F. C. R. J.]

CASPIAN-TERN [*Sterna tschegráva* Lepechin; *Sterna cáspia* Pallas. French, *sterne tschegrava*; German, *Raub-Seeschwalbe*; Italian, *beccapesci maggiore*].

1. **Description.**—Distinguished by its large size, its conspicuously heavy red beak, and by the fact that the tail is very short in proportion to the size of the bird, the wings when closed extending far beyond it. Length 20 in. [508 mm.]. The adult in nuptial plumage has the top of the head and back of the neck rich glossy bluish black, lower neck white merging into the light grey of the mantle, wings, and tail; primary feathers silvery grey, shafts ivory white; the entire under parts white; iris dark brown; bill vermilion red, inclining to horn-colour at the tip; legs and toes black. The female is slightly smaller than the male. The winter differs from that of the nuptial dress in that the head is beautifully streaked with black and white. Young in down are covered with pale buff down inconspicuously mottled with dull brown, under parts white. [w. p. p. and t. w.]

2. **Distribution.**—In the Baltic colonies exist on the coasts of Southern Finland and those of Sweden south of lat. 60°, and in the North Sea the famous Sylt colony still survives. In the Mediterranean there are small breeding-places in Spain, Sardinia, Tunisia, and on the east coast of the Adriatic. Large colonies may be met with in the Black Sea, the Dobrogea, and the Sivash, as well as on the Caspian and the salt steppes adjoining. In Asia it has been found breeding in the Persian Gulf, Ceylon, and from Transcaspia across Siberia to Amuria and Ussuri Land. In Africa it is known to breed in the Gambia on the west coast and also in South Africa, and from the Zambesi to the Red Sea on the east side. Australia and North America are also included in the breeding range of this widely distributed species. In winter European birds migrate southward to the African coasts, and Asiatic birds probably winter in Southern Asia and the Malay Archipelago; American birds range south along the Atlantic to the Gulf of Mexico. About nineteen definite records from England, and it has strayed as far north as the Færoes. [F. C. R. J.]

SOOTY-TERN [*Sterna fuliginósa* Gmelin. French, *sterne fuligineuse*; German, *russbraune Seeschwalbe*; Italian, *rondine di mare scura*].

1. **Description.**—Distinguished in the adult summer plumage by having the head, lores, and back black, and the forehead white. Length 14·5 in. [368 mm.]. Top of the head deep black, forming a cap; mantle, back, rump, middle tail feathers, and wings sooty black; outer tail feather white, passing into black at the tip; whole of the under parts, including the axillaries and under wing-coverts, pure white. The adult in winter differs in having the head streaked with white. The juvenile dress has the under parts blackish, very indistinctly barred with dirty white, the upper parts black, each feather with the base white and the tip reddish brown or whitish buff. The young in down is prettily mottled with dusky-brown and white above, and the under parts are whitish. [w. p. p. and t. w.]

2. **Distribution.**—This species breeds in colonies in the tropical and sub-tropical seas. In the West Atlantic it breeds on the coasts and islands of America from the Bahamas, Florida (Tortugas), and various islands in the West Indies and off the coast of Venezuela and Brazil (Fernando Noronha), and on the east side on Ascension and St. Helena. In the Indian Ocean the chief breeding-places are Round Island (Mauritius), Diego Garcia, the Farquhar Isles, Zanzibar coast, the Laccadives, Mekran coast, and Sunda group. In the Australian seas it breeds on Houtman's Abrolhos and in Torres Straits (Raine and Lord Howe Isles); and in the Pacific on the Kermadec Isles, Riu-Kiu Isles, Gilbert Isles, Phoenix Isles, Samoa, Norfolk Island, Christmas Island, etc. As a straggler it has occurred as far north as the Gulf of St. Lawrence and Maine in North America, and France, Italy, Germany, and six times in the British Isles, on the European side; while in the Pacific it has been recorded north to the Aleutian Isles and south to the Tasmanian and New Zealand Seas. [F. C. R. J.]

LESSER SOOTY-TERN [*Sterna anastheta* Scopoli].

1. Description.—Differs from *S. fuliginosa* in having the mantle umber-brown instead of black. Length 14 in. [355 mm.]. A band of white across the forehead is continued backwards over the eyes; top of the head and lores deep black; a white collar surrounds the hind neck; mantle, back, rump, and middle tail feathers umber-brown; wings black above, white below; entire under surface white. The winter differs from the summer plumage in that the top of the head is black, each feather fringed with white, and the forehead is uniform white. The young bird has the umber-brown feathers of the upper part margined with golden buff, the wings black above, greyish white below, and the whole of the under parts white. [W. P. P. and T. W.]

2. Distribution.—This species also breeds in colonies in the tropical seas, and colonies exist in the Bahamas, Honduras, and West Indies, off the coasts of West Africa, the Red Sea, Persian Gulf, Zanzibar coast, Madagascar, and Mascarene Isles, shores of the Indian Ocean, Malay Archipelago, Australia (Houtman's Abrolhos, Rottneet Island, Torres Strait, and Queensland), and at many stations in the Pacific. The local forms of this species require further study. One alleged occurrence in England, at the mouth of the Thames, Sept. 1875, requires confirmation.

[NODDY [*Anous stolidus* (Linnaeus)].—Two specimens said to have been obtained in Ireland about 1830. The species is not regarded by Mr. Ussher as entitled to a place in the Irish list. [F. C. R. J.]

THE GULLS¹

[ORDER: *Charadriiformes*. FAMILY: *Laridæ*. SUBFAMILY: *Larinæ*]

SABINE'S GULL [*Xema sabini* (Sabine). French, *mouette de Sabine*; German, *gabelschwänzige Möve*].

1. Description.—Distinguished at all ages by the distinctly *forked* tail. The adult in nuptial plumage has a grey-brown cap with a deep black collar encircling the lower part of the neck. Mantle, lower back, scapulars, and wing-coverts dark grey; neck, rump, tail, and under parts pure white; primaries for the greater part black, tipped with white, inner primaries and secondaries white; iris dark brown; bill black to the angle, chrome-yellow anteriorly; inside of mouth vermilion; a dark vermilion ring round the eye, with a minute spot of white below; legs and feet black. Length 13 in. [331 mm.]. After the autumn moult the head is white, with a black patch on the back of the neck and ear-coverts. The young bird has the feathers of the upper parts and sides of the chest ash-grey edged with yellowish buff, remainder of the under parts white; tail pure white, barred at the extremity with deep black; primary flight-feathers black, innermost secondaries white. [W. P. P. and T. W.]

2. Distribution.—An Arctic species, breeding on the northern coasts and islands of North America from Alaska to Baffin's Bay and Greenland, and on the Arctic islands of Europe and Western Asia. Among American breeding-places may be mentioned North Alaska, Franklin and Liverpool Bays, Southampton Island, Melville Peninsula, Cambridge Bay, Prince Albert's Land, West Greenland (lat. 75°) and N.E. Greenland. In the Old World it nests on Spitsbergen, on the Taimyr Peninsula, and in the Lena delta. In winter it has been met with almost regularly in the British Isles, and also south to France, Germany, Holland, Denmark, Austro-Hungary, and Switzerland; while in America it ranges south to Bermuda, Texas, and lat. 12° S. on the Pacific side, and has occurred in Peru. [F. C. R. J.]

¹ Vol. iii. p. 114.

WEDGETAILED-GULL [*Rhodostethia rosea* (MacGillivray). Ross's gull, rosybreasted-gull, cuneatetailed-gull. Italian, *gabbianello del Ross*].

1. **Description.**—Distinguished at all ages by its cuneate tail, the central pair, even in the youngest fully-fledged example, being more than half an inch longer than the next pair. Length 13 in. [331 mm.]. In the adult in summer plumage the head and the whole of the under parts are pure white, the latter suffused with pink; back and wings light grey; first primary with the outer web black; rump, upper tail-coverts, and tail rosy white; neck surrounded by a narrow ring of black feathers; bill black; ring round the eye vermillion; legs, feet and their webs bright red. The adult in winter is similar to the above, but the black collar is absent and the rose bloom is wanting. The young bird has the head white, the eye surrounded with black, a black spot on the ear-coverts, and the wing-coverts black; quills black on the outer web, white on the inner two-thirds; inner primaries white, tipped with black; tail white, with a broad black band at the extremity. [W. P. P. and T. W.]

2. **Distribution.**—This is also an Arctic species, which will probably be found breeding at many points in the Arctic coasts of the Old and probably also of the New World, but at present the only known breeding-place is that discovered by Buturlin at Podhodskoe in the Kolyma delta in N.E. Siberia in 1905. One specimen has been recorded from England on somewhat doubtful authority (Yorkshire 1846-47), but it has been recorded from the Faeroes and Heligoland as a casual, and once from Cagliari (Sardinia). [F. C. R. J.]

BONAPARTE'S GULL [*Larus philadelphia* (Ord)].

1. **Description.**—In summer plumage may be distinguished from *L. melanocephalus*, the Mediterranean blackheaded-gull, by having the bill as well as the hood black, differing otherwise only in having the inner primaries widely banded with black at the tip as well as by its slightly larger size. Length 14 in. [355 mm.]. Iris dark brown. Adult in winter similar, but the head is white, mottled and streaked with greyish brown. The young bird resembles the adult in winter plumage, but the back and scapulars are reddish brown fringed with buff; the outer webs of the first three flight-feathers are black; there is a broad band of black across the end of the tail, and there is a black patch on the ear-coverts. [W. P. P. and T. W.]

2. **Distribution.**—A North American species, which breeds in the wooded lake districts of that continent from Alaska and North Mackenzie south to British Columbia and South Keewatin. In winter its range extends south to Florida, Texas, and Yucatan on the east side, and on the west side to Lower California and Mexico. As a casual it has occurred in Bermuda and the Bahamas, and in Europe once on Heligoland and six times in the British Isles. [F. C. R. J.]

MEDITERRANEAN BLACKHEADED-GULL [*Larus melanocephalus* Temminck; *Larus melanocephalus* Natterer. Adriatic Gull. French, *goëland à tête noire*; German, *schwarzköpfige Möve*; Italian, *gabbiano corallino*].

1. **Description.**—In summer plumage may be distinguished from the common black-headed-gull by having the hood deep black instead of dark brown. Length 15 in. [381 mm.]. The whole of the head is of a deep velvety black, excepting a small crescentic patch of white feathers above and below the eye; back of the neck, rump, upper tail-coverts, and under surface of body, including the axillaries and under surface of the wings, pure white; mantle and wing-coverts pearly grey; primary flight-feathers silvery grey, with the shafts white; outer primaries fringed with black on the outer web; bill coral red; legs and feet red. After the autumn moult the head is white, streaked with black. The young bird is similar to the adult in winter, but the wing-coverts are streaked and mottled with brown; the primaries are blackish brown on the outer web, and white or greyish white on the inner web, and the tail is widely banded with black at the extremity. [W. P. P. and T. W.]

2. **Distribution.**—The only certain breeding-places of this species lie in the eastern Mediterranean and the Black Sea, but it is possible that a few may breed in South Spain, where it has been met with in the breeding season. It is known to breed in Greece near Lamia, on the Turkish coast (Thaso), in Asia Minor (mouth of the Meander River and Gulf of Smyrna), and in the lagoons of the Dobrogea, as well as in Bessarabia, the Putrid Sea (Sivash), and the shores of the Crimea. As a straggler it has occurred on the Bodensee, the Rhine, and in France at the mouth of the Somme, as well as at least three times in England. Its winter quarters extend south to the North African coast, the Red Sea, and Nubia. [F. C. R. J.]

GREAT BLACKHEADED-GULL [*Larus ichthyaëtus* Pallas. German, *Fisch-Möve*; Italian, *gabbiano del Pallas*].

1. **Description.**—In summer plumage may be at once distinguished by its very large size, coupled with its black head. Length 26 in. [660 mm.]. The whole of the head and back of the neck is of the deepest black, very sharply defined from the pure white neck and under parts; the eyes are banded above and below with white crescent-shaped patches; back, scapulars, secondaries, and wing-coverts of a delicate pearl-grey; primaries white, with black along the margin of the outer web of the first primary, and with black submarginal markings towards the tip; upper tail-coverts and tail pure white; the bill is orange-yellow, with a black and red band at the angle; legs and feet greenish yellow; webs orange. In winter the head is streaked and mottled with blackish, otherwise it resembles the adult in summer. The immature bird is mottled all over the upper parts with dusky brown, and the terminal third of the tail is black sharply defined from the white base. The nestling differs from all other young gulls by having the plumage of a greyish white colour without markings. [W. P. P. and T. W.]

2. **Distribution.**—Confined during the breeding season to the Russian empire, where it nests, according to Buturlin, on the Putrid Sea (Sivash), the Caspian and Aral Seas, the Sarpa lakes on the lower Volga, on Suliuk-kul and Chalkar-teniz, and the lower Irgiz and Turgai rivers. It has occurred in England (once off Exmouth, in 1859) and in Switzerland, and migrates south to Cyprus, Palestine, the Nile valley to Nubia, the Red Sea and Persian Gulf and South Persia, India, Ceylon, and Burma. [F. C. R. J.]

YELLOWLEGGED HERRING-GULL [*Larus argentatus cachinnans* Pallas. Mediterranean herring-gull. French, *goëland argenté méridional*; German, *südliche Silber-Möve*; Italian, *gabbiano reale*].

1. **Description.**—Resembles the common herring-gull, *L. argentatus* (see vol. iii. p. 122), but may be at once recognised by the bright orange-red (instead of yellow) orbital ring and the legs and feet, which are brilliant yellow (instead of flesh-colour). Length 18 in. [457 mm.]. The sexes are alike. The whole head, neck, rump, upper and under tail-coverts and tail, as well as the entire under parts, pure white; mantle, back, scapulars, and wing-coverts grey; major wing-coverts, secondaries, and scapulars broadly tipped with white; primaries on their basal half dark grey, terminal half black tipped with white. In some specimens there is a mirror of white near the tips. The adult in winter has the head and neck streaked with blackish brown. The immature bird has the upper surface of the body white, marbled all over with greyish brown; primaries dark brown above, light greyish brown below with white shafts; under surface white, scantily marbled with greyish brown; tail with the basal half white somewhat irregularly barred with greyish brown, terminal half brown tipped with white. The young in down has the upper parts buffish white, with deep black spots on the head and mottled with blackish brown markings over the rest of the upper parts; below white, merging into buffish white on the neck and throat, with two pairs of blackish spots situated on the fore-neck and at the base of the bill. [W. P. P. and T. W.]

2. **Distribution.**—This race replaces the ordinary herring-gull during the breeding season in the Azores, Canaries, and Madeira, and also throughout the Mediterranean, Black and Caspian Seas, through Western Asia east to Lake Baikal, and according to Buturlin also on the Amur and Kamtschatka, while the same writer also states that it breeds in the Gulf of Finland, Lake Onega, the White Sea, and the Vologda government. In the winter months it migrates along the coasts of Africa south to Senegambia and Angola on the west, and the Red Sea and Abyssinia on the east side, while in Asia it winters in the Persian Gulf, Mekran coast, and the Bay of Bengal. One specimen has been shot (Norfolk, 1886) and another seen in England. [F. C. R. J.]

SCANDINAVIAN BLACKBACKED-GULL [*Larus fuscus fuscus* Linnæus].

1. **Description.**—Differs from the British form, which has been recently distinguished, by its slaty black instead of slaty grey mantle and rather longer wing (cf. Dr. P. R. Lowe, *British Birds*, vi. p. 2).

2. **Distribution.**—Scandinavia east to the Dwina. Two recorded from Suffolk coast in 1881 and 1887 (*Brit. Birds*, vii. p. 59). See also under Lesser Blackbacked-Gull, vol. iii. p. 126. [F. C. R. J.]

IVORY-GULL [*Pagóphila eburnea* (Phipps). Snow-bird. French, *mouette blanche*; German, *Elfenbein-Möve*].

1. **Description.**—May be at once distinguished from all other gulls by having the entire plumage white, quite devoid of markings. Length 18 in. [457 mm.]. The wings are long, extending beyond the extremity of the tail; the iris is dark brown, fleshy eyelid of a brick-red colour; tips of mandible yellow, shading into French grey at the base; legs and feet black. The immature differs from the adult in having a few rounded brownish grey markings on the back of the neck, mantle, scapulars, and wing-coverts; and each primary, as well as the tail, has a large spot of the same colour at the tip; feathers at the base of the culmen and on the sides of the throat tipped with bluish grey. [W. P. P. and T. W.]

2. **Distribution.**—This is a circumpolar species, which breeds in Spitsbergen, Storöen, King Karl's Land, Franz Josef Land, Lütke Land (Novaya Zemlya), Bennett and Herald Islands in the Old World, and on the Polynia Isles, Prince Patrick Island, Cape Krabbé, Grinnell Land, Davis Strait, and North-east Greenland in the New World. In winter it has been recorded about forty-seven times from the British Isles, and also from the Færoes, the coasts of Scandinavia and Finland, and exceptionally from Schleswig, the mouth of the Somme in France, and Lausanne in Switzerland. In America its winter range extends to British Columbia, Ontario, and Long Island. [F. C. R. J.]

[THE SHEATHBILL or KELP-PIGEON [*Chionis alba* (Gmelin). Family: *Chionididae*].—Has been obtained in Ireland on one occasion (Co. Down, 1892), but may have been an escaped bird. It is an Antarctic species, breeding on the Falklands and South Orkney Isles. [F. C. R. J.]

THE PRATINCOLES AND COURSERS

[ORDER: *Charadriiformes*. FAMILY: *Glareolidae*]

PRATINCOLE [*Glireola pratineola* (Linnæus). Collared-pratincole. French, *perdrix de mer*; German, *Halsband-Giarol*; Italian, *pernice di mare*].

1. **Description.**—Distinguished from the blackwinged-pratincole by its chesnut axillaries, whereas in the latter species these feathers are black like the under wing-coverts. Total length about 9.5 in. [238 mm.]. The sexes are alike in coloration, and no seasonal change takes place. The adult has the upper parts, including the wing-coverts, olive-brown very slightly tinged with greenish; upper tail-coverts and basal half of tail, which is

very deeply forked, pure white, the terminal half blackish brown, slightly glossed with greenish; primaries black; shafts, of the first feather white, remainder brown; cheeks and throat sandy buff, surrounded by a black line; chest sandy buff, remainder of under surface white; under wing-covert and axillaries deep chesnut; iris brown; bill dark brown, red at the base; legs and feet black. The young bird resembles the adult in all essential characters, but the feathers of the upper parts are glossy greenish grey fringed with buff and subterminally marked with black. [w. p. p. and t. w.]

2. Distribution.—Confined in the breeding season to the Mediterranean region, nesting in North Africa from Marocco and Algeria to Tunisia, though in Egypt it has not yet been definitely proved to breed. In Europe it nests commonly in S. Spain and Portugal, sparingly in S. France, Italy, and Sicily, also in Hungary, the lower Danube valley, Montenegro, Turkey, and Greece, and in Russia in the south-west, the Riazan and Ural governments. In Asia it nests in Asia Minor, Palestine, and from Transcaspia east to Turkestan. Other allied forms breed in Tropical and Eastern Asia from Mesopotamia eastward, and also in Tropical and South Africa. European birds probably winter in North Africa, and stragglers have occurred in Germany, Holland, Belgium, Denmark, and some twenty-five times in the British Isles. [F. C. R. J.]

BLACKWINGED-PRATINCOLE [*Glareola nordmanni* Nordmann; *Glareola melanoptera* Nordmann. Nordmann's pratincole. German, *schwarzflügeliger Giarol*; Italian, *pernice di mare orientale*].

1. Description.—Distinguished from the common pratincole by the axillaries and under wing-coverts, which are black instead of deep chesnut; otherwise it exactly resembles the last-named species. [w. p. p. and t. w.]

2. Distribution.—A few pairs of this species appear to breed in Hungary and the Dobrogea, but the main breeding-grounds lie in South Russia, rarely in the south-west, but commonly in the governments of Kief, Chernigov, Kharkov, S. Riazan and Simbirsk, Ufa, Orenburg, Ural and Turgai, and thence eastward in Siberia to about 81° E. long. and 54° N. lat. (Buturlin). This species winters in Tropical and South Africa, where it has been met with south to Cape Colony. As a straggler it has occurred in Sicily and Italy, and eight times in England (Sussex, Kent, and Yorkshire). [F. C. R. J.]

CREAMCOLOURED-COURSER [*Cursorius gallicus* (Gmelin). French, *courvite isabelline*; German, *europäischer Rennvogel*; Italian, *corrione biondo*].

1. Description.—Has the axillaries and under wing-coverts nearly black, and the outer web of the secondaries buff. The sexes are alike in coloration; and there is no seasonal change of plumage, though specimens from the more western localities are rather more sandy in appearance, and often have less black on the subterminal band of the tail. Length 9.5 in. [238 mm.]. General colour of the plumage isabelline buff, with a patch of lavender on the occiput; primaries black; secondaries on their inner webs blackish brown, externally sandy buff tipped with white; tail with a subterminal bar of black and a white tip; under tail-coverts and lower abdomen white; iris umber-brown; bill dusky black; angle of mouth and base of lower mandible white; feet livid yellow. The immature bird resembles the adult, but the feathers of the back are vermiculated with dusky black. The legs are long and well adapted for running. [w. p. p. and t. w.]

2. Distribution.—Breeds in Northern Africa, from the Canaries (especially Fuertaventura) and the Cape Verde Islands, across the Sahara and South Marocco, Algeria, Tunisia, and Tripoli east to Egypt, Nubia, and Kordofan, but replaced by allied races in Somaliland, the Dahlak archipelago in the Red Sea, and Transcaspia and other parts of Asia. Though to a great extent sedentary, it has frequently occurred in Europe—in Spain, Sicily and Malta, Italy, France, the Channel Isles, Germany, Heligoland, Hungary, Holland, Belgium, and about twenty-five times in the British Isles. [F. C. R. J.]

THE PLOVERS¹[ORDER: *Charadriiformes*. SUBORDER: *Limicolæ*. FAMILY: *Charadriidae*.SUBFAMILY: *Charadriinæ*]**CASPIAN-PLOVER** [*Charadrius asiaticus* Pallas; *Ægialitis asiatica* (Pallas). German, *kaspische Regenpfeifer*; Italian, *corriere asiatico*].

1. **Description.**—Recognised by the rich chesnut chest, banded below with black, and the white axillaries. Length 8 in. [203 mm.]. Adult in breeding plumage—general colour of the upper parts smoky brown except a white band across the forehead, which extends backwards over the eye to the ear-coverts; primaries black, with white shafts; throat, belly, under tail-coverts, under wing-coverts, and axillaries white; across the upper chest there is a broad band of rich chesnut, bordered below by a band of black; iris hazel; bill black; feet greenish olive, toes dusky. In the adult in winter plumage the chesnut and black of the chest is replaced with sandy buff, and the forehead, sides of the face and chin are washed with isabelline. [w. p. p. and t. w.]

2. **Distribution.**—According to Buturlin this species breeds from the mouth of the Volga and the lower Ural north to about lat. 51°, east of the Magodjary Mountains, and in the Turgai government to about lat. 49½°; apparently also in the Akmolinsk government and the Atbassar district. It ranges east to Dzungaria and the Tian Shan and south to the Oxus. On migration it visits South Persia and Arabia, and has been recorded from India, while in Africa it follows the Nile Valley, and passing through the Egyptian Sudan and Abyssinia reaches Damaraland and Cape Colony. In Europe it has occurred west as far as Italy (twice), Bulgaria, Heligoland (twice), and three or four times in England (Norfolk and Sussex). [F. C. R. J.]

LITTLE RINGED-PLOVER [*Charadrius dubius* Scopoli; *Ægialitis curonica* (J. F. Gmelin). French, *petit pluvier à collier*; German, *Fluss-Regenpfeifer*; Italian, *corriere piccolo*].

1. **Description.**—Differs from the ringed-plover in having the bill black, not orange-yellow at the base as in the latter species, and by having the inner webs of the inner primary quills uniform, whereas the ringed-plover has a "blaze" of white across the primaries. Length 7 in. [177 mm.]. Adult banded across the forehead with a black and white bar, and a collar of white feathers bordered with black encircles the neck. General colour above, ash-brown; sides of rump and lateral upper tail-coverts white; primaries uniform dark brown, first feather with the shaft white, central tail feathers like the back, but indistinctly barred with blackish brown towards the tip; outer tail feathers white, with a bar of blackish brown; chin, throat, and under parts pure white, with the exception of a deep black collar across the fore-neck. The young resembles the adult, but lacks the black collar across the chest. Iris dusky brown; orbital skin yellow; bill dusky black; feet flesh-colour. [w. p. p. and t. w.]

2. **Distribution.**—This species, unlike the ringed-plover, avoids the sea-coast and haunts shingle-beds and sand-flats by large rivers and inland lakes. In Europe it breeds north to Scandinavia (in Sweden up to lat. 62° N.), and in Russia to 64° in Finland, 67¼° on the White Sea, and about 60° in the Perm government. Southward it is found locally in suitable localities throughout the Continent south to the Straits of Gibraltar and the Mediterranean, as well as in some of the Mediterranean Islands. In the Pyrenees it is found up to 4000 feet (Saunders). It also breeds in Northern Africa—Madeira, Morocco, Algeria and Tunisia, and Egypt; and in Asia from West Siberia, Transcaspia, Asia Minor and Palestine, eastwards to the Sea of Okhotsk, Mongolia, China, and Japan. Southward it breeds in Mesopotamia, India, the Shan States, and apparently the Philippines, but by some writers a tropical race has been regarded as distinct.

¹ Vol. iii. p. 313.

To the British Isles it is a curiously rare visitor, having only been recorded about nine times; and winters in Africa south to the Gaboon and Mozambique, as well as in Southern Asia, Ceylon, and the Malayan Archipelago (Moluccas, Palawan, and New Guinea). [F. C. R. J.]

KILDEER-PLOVER [*Charadrius vociferus* Linnaeus; *Ægialitis vocifera* (Linnaeus)].

1. **Description.**—Recognised by the long and wedge-shaped tail and the cinnamon-coloured rump and upper tail-coverts. Length 9 in. [228 mm.]. General colour above, dark brown slightly glossed with green; a white band across the forehead followed by a band of black; the white of the throat is continued round the back of the neck, forming a distinct collar; rump and upper tail-coverts rich cinnamon rufous; middle tail feathers coloured like the back, with a band of black towards the tip; outer tail feathers cinnamon, banded with black and broadly tipped with white; under parts pure white, with a band of deep black across the lower throat and another across the upper chest; under wing-coverts and axillaries white; iris dark brown; eyelids orange or scarlet; bill black; feet pale pinkish or pale greyish yellow. The young bird differs from the adult in having rufous edges to the feathers of the upper parts. [W. P. P. and T. W.]

2. **Distribution.**—An American species, which breeds from British Columbia, the Saskatchewan plains, Manitoba, and Ontario southward to Central Mexico. It winters in Central and South America from California to Venezuela, Peru, and occasionally Paraguay and Chile. Six occurrences are recorded from Great Britain (all but one from the south coast), and it is said to have been obtained on the island of Madeira. [F. C. R. J.]

AMERICAN GOLDEN-PLOVER [*Charadrius dominicus dominicus* Müller. Lesser golden-plover].

1. **Description.**—Distinguished from the common golden-plover by the axillaries, which are grey instead of pure white. Length 10 in. [254 mm.]. Adult in breeding plumage—general colour above, black with large spots of golden buff; running across the forehead, and continued down the sides of the neck on to the chest, is a broad line of white, while the sides of the face, throat, chest, and remainder of under parts are of a deep black; under wing-coverts and axillaries smoky brown; iris dark hazel; bill, legs, and feet black. After the autumn moult the black of the under parts is wanting, being replaced with buffish feathers spotted on the chest and obscurely barred with dusky brown on the sides of the body; under tail-coverts white. [W. P. P. and T. W.]

2. **Distribution.**—This race of lesser golden-plover breeds in Arctic North America from Hudson Bay westward, including the Barren grounds and the coasts of the Arctic Sea to the north of the Mackenzie, but in Northern Alaska it is replaced by the Siberian form. It is said also to breed in northern British Columbia, and possibly also on the Parry Islands, Greenland. It migrates south along the Atlantic side of America in winter to Brazil, Chile, and Argentina, and visits the West Indies and Bermuda on migration, while it has occurred three or four times in the British Isles, and once on Heligoland, in 1847. [F. C. R. J.]

SIBERIAN GOLDEN-PLOVER [*Charadrius dominicus fulvus* Gmelin. Eastern golden-plover. French, *pluvier fauve*; German, *kleiner Gold-Regenpfeifer*; Italian, *Piviere orientale*].

1. **Description.**—Scarcely distinguishable from the American golden-plover, but it is a slightly smaller bird, and has the innermost secondaries relatively longer, extending to within 0.5 to 0.8 inch of the tip of the wing; in the American golden-plover these feathers fall short of the tip—when the wing is closed—by from 1½ to 2 inches. The sexes are alike in coloration,

excepting that the male has the black of the under surface more uniform. The seasonal change of plumage is the same as that of *C. pluvialis*. [w. p. p. and t. w.]

2. Distribution.—This race breeds on the tundra of Arctic Asia, from the shores of the Kara Sea east across the continent to Kamtschatka, the Sea of Okhotsk, and the mouth of the Amur, as well as in Alaska, where it meets the American race, but is predominant on the shores of Bering Sea. It migrates along the Pacific side of America to Chile, and also passes through Asia to winter in India, the Malay Peninsula, the Malay Archipelago, and many of the island groups of the Pacific, south to Australia and New Zealand. As a straggler it has wandered west to Poland, Heligoland, Malta (twice), South Spain, Algeria (once), and two or three times to Great Britain. [F. C. R. J.]

SOCIABLE-PLOVER [*Chettusia gregaria* (Pallas); *Vanellus gregarius* (Pallas). German, *Herden-Kiebitz*; Italian, *pavoncella gregaria*].

1. Description.—Recognised by its broad and rounded wing and the large black and chesnut patch on the belly. Total length about 12 inches [305 mm.]. There is no seasonal change of plumage, and the sexes are alike in coloration. The adult has the forehead white, extending in a broad line backwards over the eye and uniting on the back of the head; crown of the head and lores deep glossy blue-black; remainder of upper parts, including the long secondaries, light ashy grey; sides of the face reddish buff; throat white; chest dark ashy grey; belly black; lower abdomen chesnut; under tail-coverts white; sides of the rump and upper tail-coverts white; basal two-thirds of tail white, with a broad black band occupying the terminal third and tipped with white, the black bars on the tail feathers gradually diminishing in extent, until on the outer pair it becomes absent; iris dark brown; bill and feet black. The young bird differs from the adult in having the belly white, the feathers of the chest with dusky cross bars and tips to the feathers, and in lacking the black crown. [w. p. p. and t. w.]

2. Distribution.—In Russia this species breeds in the central governments up to 49°-50° N. and 56° in the Perm government, and is common in the Kirghiz steppes, but is absent from Transcaucasia. In Asia it breeds in Transcaspia north of the Ust-Urt Mountains and thence to the south of the Tobolsk and south-west of the Tomsk governments (lat. 53° N.), and east to Zaissan-Nor (Buturlin). It migrates in winter over the Pamirs to North-west India and Ceylon, Arabia, and North-east Africa (Egypt, Nubia, the Sudan, and Abyssinia). It has also occurred as a casual in Poland, Hungary, Italy (seven times), South France, and Spain (once). Four specimens have been obtained and others seen in the British Isles. [F. C. R. J.]

THE STILTS¹

[ORDER: *Charadriiformes*. SUBORDER: *Limicolæ*. FAMILY: *Charadriidæ*.

SUBFAMILY: *Himantopodinae*]

BLACKWINGED-STILT [*Himantopus himantopus* (Linnæus); *Himantopus candidus* Bonnaterre. French, *echasse blanche*; German, *grauschwänziger Stelzenläufer*; Italian, *cavalier d'Italia*].

1. Description.—Distinguished by its extremely slender legs measuring about 10 inches long, by having scarcely any web between the toes, and no hallux, and by its long thin bill 2½ inches [63 mm.]. The adult male has the general colour of the upper surface black with a greenish gloss; back and rump white; upper tail-coverts pale grey; wings black glossed with green; head neck, and the whole of the under parts pure white; under wing-coverts black; axillaries white; iris deep carmine; bill blackish; feet rose-pink. The adult female differs from the male in

¹ Vol. iii. p. 413.

having the mantle, scapulars, and inner scapulars brown instead of black. The young in first plumage is very like the adult female, but the feathers of the back and wings have buff margins, and the crown and nape of the otherwise white head brown, and the white under parts have a shade of grey on the fore-neck. Young clad in down of an isabelline colour above, with streaks of black down the lower back and rump. [W. P. P. and T. W.]

2. Distribution.—Breeds locally in the Mediterranean region, as well as throughout Africa and Southern Asia. In Northern Africa it nests in Morocco, Algeria, Tunisia, and Egypt, and in Europe commonly in South Spain and Portugal, the Camargue, Sicily, Greece, Dalmatia, the Dobrogea, Turkey, Hungary, and South Russia (Kirghiz steppes and up to 49° on the Volga). In Asia it breeds from Transcaspia, Asia Minor, Cyprus, and Palestine east to India, Ceylon, Burma, and the upper Hoang-Ho valley. In the northern portions of its breeding range it is migratory, European birds wintering in Africa and Asiatic birds in the southern portion of that continent. As a casual visitor it has occurred in most of the countries of Central Europe and on the Atlantic Isles, and fairly often in the British Isles, though less so of late years. [F. C. R. J.]

THE SANDPIPERS AND RELATED SPECIES¹

[ORDER: *Charadriiformes*. SUBORDER: *Limicolæ*. FAMILY: *Charadriidæ*.
SUBFAMILY: *Tringinae*]

BROADBILLED-SANDPIPER [*Limicola platyrhyncha* (Temminck). German, *kleiner Sumpfläufer*; Italian, *gambeccio frullino*].

1. Description.—Differs from the dunlin in having the bill broad, conspicuously flattened, and terminating in a point which is slightly decurved. Total length about 7·5 in. [191 mm.]. The adult in its nuptial plumage has the upper parts black with bright rufous edges to the feathers, and tipped with white; a well-defined white eyebrow extending to the base of the bill; throat and under surface of the body white; the fore-neck and chest thickly spotted with black and tinged with rufous; tail feathers brownish white, becoming white on the inner web; middle tail feathers dusky brown, margined at the extremity with rich buff; iris hazel; bill dusky black; legs and feet slaty black. After the autumn moult the feathers of the upper parts are brownish grey without the rufous edges to the feathers. [W. P. P. and T. W.]

2. Distribution.—In Scandinavia this species breeds in the high north and on the marshes in the high fjeld south to the Dovre in Norway, and in Sweden occasionally south to Jemtland, Vestergötland, and Öland, and regularly in Lapland; also in Finnish Lapland, and, according to Buturlin, probably in Russia near St. Petersburg, in the basin of the Ilek and near Kazan, while eastward it may breed in the Turgai government, and even east of the Yenisei, but in East Siberia is replaced by a lighter race, which ranges east to the Sea of Okhotsk and west probably to Baikal. On migration visits nearly all the European countries except the Iberian Peninsula, south to the Mediterranean and the coasts of North Africa, while in Asia it visits the Red Sea, Mekran coast, India, Ceylon; and apparently the eastern race passes through Japan, China, Formosa, and the Malay Peninsula to Java, the Philippines, and the Moluccas. About fifteen occurrences of the western form have been recorded from the British Isles. [F. C. R. J.]

AMERICAN PECTORAL-SANDPIPER [*Pelidna*² *maculata maculata* (Vieillot); *Erolia maculata* (Vieillot); *Tringa maculata* (Vieillot)].

1. Description.—Distinguished from the Siberian pectoral-sandpiper by the pectoral band which is spotted and barred instead of streaked; the less heavily marked flanks; the white under tail-coverts, and the rounded tips to the tail-feathers. [W. P. P. and T. W.]

¹ Vol. iii. p. 421.

² By strict priority the name *Pelidna* should be superseded by *Erolia*.

2. **Distribution.**—This race breeds on the Arctic shores of North America from Alaska to Hudson Bay, but the only definite records of nesting are from the Point Barrow district, Alaska. Its winter quarters lie in South America from Peru and Bolivia to Chile, Argentina, and Patagonia. It is said to have occurred as a casual in North-east Siberia, and has been recorded from Unalaska, Hawaii, Greenland, and over fifty times in the British Isles. [F. C. R. J.]

SIBERIAN PECTORAL-SANDPIPER [*Pelidna maculata acuminata* (Horsfield); *Erólia acuminata* (Horsfield); *Tringa acuminata* Horsfield].

1. **Description.**—Distinguished from the American pectoral-sandpiper by the more conspicuous striations of the fore-neck and chest, and the more pointed tips of the tail feathers. Length 9 in. [229 mm.]. The adult in breeding plumage has the upper parts black, each feather margined with rich rufous; lower back, rump, upper tail-coverts and middle tail feathers black; primaries dusky brown, the shaft of the first white, remainder brown; tail feathers greyish brown, the middle pair of which are conspicuously lengthened and acuminate; throat and belly white; lower throat and chest black, tipped with greyish white, giving these parts a heavily streaked appearance; iris dark brown; bill blackish brown, reddish brown at the angle of the gape; feet yellowish ochre tinged with olive. After the autumn moult the rufous tinge disappears, leaving the coloration altogether browner. [W. P. P. and T. W.]

2. **Distribution.**—The Siberian race breeds in North-eastern Asia on the Taimyr Peninsula, the New Siberian Islands, and the Lena and Kolyma deltas. It has also been met with in Kamtschatka and the Commander Isles. In the winter months it migrates south to Japan and from the coast of East China to New Guinea, Australia, and New Zealand. One or perhaps two occurrences are recorded from England (Breydon, Norfolk, August 1892: possibly Yarmouth, Suffolk, 1848). [F. C. R. J.]

BAIRD'S SANDPIPER [*Pelidna bairdii* (Coues); *Erólia bairdii* (Coues); *Tringa bairdii* (Coues)].

1. **Description.**—Distinguished from Bonaparte's sandpiper by the hindmost upper tail-coverts which are black instead of white. Length 7 in. [177 mm.]. Adult in summer plumage—general colour above, sandy brown heavily streaked, spotted, and blotched with black, giving the upper parts a spotted appearance; throat and belly white; chest golden buff, finely striated with blackish brown; primaries dusky brown, shafts white; tail feathers brownish grey, finely margined with white; central feathers blackish brown, finely margined with white; iris hazel; bill black; legs and feet slate-black. After the autumn moult all the light parts of the upper surface of the body are replaced with greyish brown, giving these parts a much darker appearance; throat and belly white; chest similarly marked to that of the summer plumage, but not so bright. [W. P. P. and T. W.]

2. **Distribution.**—Breeds on the barren grounds from Hudson Bay westward to Alaska but has only been proved to breed near Point Barrow and by Macfarlane on the Barren grounds. Its normal winter quarters lie in South America (Chile, Argentine, and Patagonia being its southern limits), and as a casual it has occurred once in Damaraland and three or four times in Great Britain (Sussex, Norfolk, and St. Kilda). [F. C. R. J.]

BONAPARTE'S SANDPIPER [*Pelidna fuscicollis* (Vieillot); *Erólia fuscicollis* (Vieillot); *Tringa fuscicollis* Vieillot. Whiterumped-sandpiper].

1. **Description.**—Distinguished from Baird's sandpiper by hindmost upper tail-coverts, which are white, whereas in the latter species they are black. Length 7 in. [177 mm.]. The adult in summer plumage has the upper parts black, with rich rufous buff margins to the

feathers, rather paler on the neck; throat, belly, vent, under tail, and under wing-coverts pure white; chest white, with very distinct black markings and streaks; iris brown; bill and feet dusky. The adult in non-breeding plumage is similar to the above, but the upper parts are brownish grey, devoid of the rich rufous buff margins. [W. P. P. and T. W.]

2. Distribution.—Breeds on the Arctic coasts and islands of North America. It has occurred west to Point Barrow, Alaska, and east to Greenland, and has been proved to breed on the shores of Franklin Bay and Herschel Island, and probably also in Davis Strait and in the Parry Archipelago (Prince Albert Land). On migration it passes through North America, and winters in South America south to the Straits of Magellan and the Falkland Isles. It has occurred as a casual in Bermuda and Franz Josef Land, fourteen times in England (chiefly on the south coast), and possibly once in Ireland. [F. C. R. J.]

AMERICAN-STINT [*Pelidna minutilla* (Vieillot); *Erólia minutilla* (Vieillot); *Tringa minutilla* Vieillot. Least-sandpiper.]

1. Description.—Distinguished from Temminck's stint (*Pelidna temminckii*) by the outer pairs of tail feathers, which are coloured like the rest; and from Bonaparte's sandpiper in that it is slightly smaller and has the upper surface, in the breeding season, darker, the black areas predominating over the other colours.

2. Distribution.—Breeds in North America from Sable Island, Nova Scotia, Newfoundland, the Magdalen Islands, Anticosti, and the Labrador coast west to Hudson Bay, the Barren grounds, and North Alaska. On migration it passes through North America to winter from California, Texas, and North Carolina through the West Indies and Central America to the Galapagos Isles, Chile, and Brazil. In East Siberia and Kamtschatka it is replaced by an allied form, which winters from South-east Asia to Australia. The American race has occurred in Greenland, and four times in England (Cornwall and Devon). [F. C. R. J.]

TEMMINCK'S STINT [*Pelidna temminckii* (Leisler); *Erólia temminckii* (Leisler); *Tringa temminckii* (Leisler). French, *bécasseau Temminck*; German, *Temminck's Strandläufer*; Italian, *gambeccio nano*].

1. Description.—Distinguished from the little-stint and from the American-stint by the outer pairs of tail feathers, which are pure white. Length 6 in. [152 mm.]. Adult in summer plumage—feathers of the upper parts sandy rufous with black centres, a white eyebrow extending from the base of the culmen to the ear-coverts; throat, belly, under tail-coverts, axillaries, and under wing-coverts white; chest and sides of the face ashy grey, mesially streaked with blackish. In the winter plumage the upper parts are of an ashy brown with a few indistinct black shaft-streaks to the feathers of the mantle; throat, belly, and under tail-coverts, axillaries, and under wing-coverts white; sides of the face greyish ash, faintly margined with lighter ash. The young in down is most beautifully mottled above with rufous and black, with round spots of rich buff; under parts uniform golden buff. [W. P. P. and T. W.]

2. Distribution.—Breeds in Arctic Europe and Asia: in Europe from lat. 62½° N. in Norway (in the fjeld districts) and Lapland in Sweden northward; in Finland from Ulea northward, and in Russia in Lapland, the Kola Peninsula, the lower Onega, Dwina, and Petschora, and the islands of Kolguev and Waigatz. In Asia Buturlin states that it nests on the Taimyr and Boganida (lat. 70°-71°), in the lower valleys of all the great Siberian rivers (Yenisei, Lena, Kolyma, etc.) up to about 69½°, on the Chukchi Peninsula and Anadyr. Reported breeding in the Pamirs and Alai range as well as in the Stanovoi Mountains, requires confirmation; but Buturlin states that it nests south to lat. 51° N. in the basin of the Alexei (Tomsk government). In winter it migrates through Europe to the Mediterranean region, wintering in the Mediterranean and North Africa, while Asiatic birds visit Japan, China, Burma, and the Malay

Peninsula, India, Ceylon, Persia, and Mesopotamia. To the British Isles it is a rare migrant on passage, usually met with in autumn on our south and south-east coasts. [F. C. R. J.]

BUFFBREASTED-SANDPIPER [*Pelidna subruficollis* (Vieillot); *Erolia subruficollis* (Vieillot); *Tryngites rufescens* (Vieillot)].

1. **Description.**—Distinguished by the inner webs of the primaries and secondaries, which are always marbled with black and white. Length 8 in. [203 mm.]. General colour of the upper parts black striated with buff; primaries and their coverts brown tipped with white, submarginally with black, the inner webs being freckled and marked with black, secondaries similarly marked, but the white colour predominating; middle tail feathers brownish black; outer tail feathers brown, tipped with white, submarginally barred with black; eyebrow, sides of face, and the general colour of the under parts buff with slight margins of white; upper breast sometimes spotted with black; under wing-coverts and axillaries white; inner web of primary quills below marbled with black and white; iris hazel; bill dull olive-green, dusky towards the tip; legs and feet dull yellowish green. The adult female is similar, but the black marblings on the primaries not so distinct. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in Arctic North America from Point Barrow in N. Alaska, the Barren grounds east of the Wilmot Horton River to Repulse Bay in the south of Melville Peninsula, and Herschel Island. It is also said to be resident in British Columbia. E. W. Nelson also describes it as common near Cape Wankarem in East Siberia in August. On migration it passes through North America and winters in South America (Pern, Uruguay, and Argentina). As a casual it has been recorded from Heligoland and Switzerland, and has occurred about eighteen times in the British Isles. [F. C. R. J.]

SEMIPALMATED-SANDPIPER [*Ereunetes pusillus* (Linnaeus); *Tringa pusilla* (Linnaeus)].

1. **Description.**—Recognised by its very flat bill, the tip of which is more or less spatulate. The male and female are alike in plumage, excepting that the female lacks the red colour on the upper parts. Total length 6 in. [152 mm.]. General colour of the upper parts black with reddish brown margins to the feathers of the back and scapulars; lower back smoky brown, becoming blacker on the rump and longer upper tail-coverts; under surface of the body white, streaked and spotted on the throat and chest with black; under wing-coverts and axillaries white. The adult in winter lacks the rufous and black markings of the upper surface, these parts having an almost uniform brownish grey appearance. Iris dark brown; bill black; feet greenish olive. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in Arctic North America from the mouth of the Yukon in the west to the Barren grounds, possibly in N. Saskatchewan, South Ungava, the Hudson Bay region, and the Labrador coast. It is only of casual occurrence in E. Siberia, and migrates south through North America, chiefly east of the Rocky Mountains, and winters from Texas and Carolina through the West Indies and Central America to Patagonia. In South-west Alaska it is said to be replaced by an allied race, which migrates in winter south to Florida, Carolina, Trinidad, and South America. One specimen of the eastern form has occurred in England (Kent, September 1907). [F. C. R. J.]

BARTRAM'S SANDPIPER [*Bartramia longicauda* (Bechstein). Upland-plover, field-plover. German, *Bartram's Uferläufer*; Italian, *piro-piro coda lunga*].

1. **Description.**—Recalls the ruff, in winter, in its general appearance, but is at once distinguished by the long, closely barred, wedge-shaped tail, and the forward continuation of the feathers of the throat along the lower jaw. Length 11 in. [279 mm.]. No very striking

seasonal change in plumage takes place, but the coloration during the summer is darker and less striated, owing to the light pattern of the feather being abraded and often worn quite away; the barring on the chest forms sagittate markings. General colour above, mottled; the feathers being dark brown edged with light buff; lower back and rump black; primaries and their coverts brown; secondaries dark brown, notched with white and barred with black; middle tail feathers brown, barred with black; outer tail feathers buff, broadly tipped with white, submarginally barred with black; head blackish, mesially streaked and edged with buff; eyebrow, sides of face, and ear-coverts buff, finely streaked and spotted with black; cheeks and throat white; chest buff, with triangular spots of black; remainder of under parts buffish white; sides and flanks barred with brownish black; under wing-coverts and axillaries white, banded with black; under surface of quills ashy, barred and marked with white on the inner web; iris hazel; bill yellowish green, tip dusky, cutting edges at the base yellow; legs and feet light yellowish grey; toes darker. [W. P. P. and T. W.]

2. Distribution.—Breeds in North America, probably from Fort Yukon in Alaska, and certainly in the whole of the prairie region from the Peace River district in the north and the Rocky Mountains on the west to Missouri, Indiana, and North Virginia in the south and also sparingly east to Ontario, being most numerous in Western Manitoba and Eastern Saskatchewan. Its winter quarters lie on the Pampas of S. America, south to Argentina and Brazil. As a casual it has occurred about eleven times in the British Isles (but not in Scotland or Wales); also in Malta and Italy (twice), perhaps also in Holland, and according to Gould once in Australia. [F. C. R. J.]

MARSH-SANDPIPER [*Tótanus*¹ *stagnátilis* Bechstein; *Tringa stagnátilis* (Bechstein). French, *chevalier stagnatile*; German, *Teich-Wasserläufer*; Italian, *albastrello*].

1. Description.—Closely resembles the redshank in general plumage, but readily distinguished by its blue-black legs and feet. The sexes are alike in coloration, and there is a seasonal change of plumage. Length $11\frac{1}{2}$ in. [292 mm.]. General colour of the upper parts dull bronze-brown, marked and barred with black; primaries black; shafts of the first primary ivory-white; under surface of the body, including the under wing-coverts and axillaries, white. In the winter plumage all the feathers of the upper parts are fringed with white.

2. Distribution.—In Europe this species is only known with certainty to breed in the south-east, and statements that it has bred in S. France and N.W. Africa require confirmation. It nests in small numbers in Hungary, and in South Russia in Bessarabia and the governments of Kherson, Kief, Orel, Tula, Riazan, Kazan, Ufa, and Perm. In Asia it breeds in Western Siberia up to $55\frac{1}{2}^{\circ}$ (Baraba Steppe), Turkestan, and, according to Buturlin, to about 56° N. on the Upper Olekma basin in East Siberia. On migration it has occurred in nearly all the European countries south of the Baltic, but is rare in the west, and winters in Africa, where it has been met with south to Cape Colony, and in Asia winters in Mesopotamia, Persia, India, the Malay Peninsula, China, and the Malay Archipelago south to Australia. Has occurred four times in England (three Sussex and one Herts). [F. C. R. J.]

SPOTTED-SANDPIPER [*Tótanus maculárius* (Linnæus); *Tringa maculária* (Linnæus)].

1. Description.—Distinguished from the common-sandpiper in the more heavily striated upper surface, and in having the under surface of the body thickly spotted with black; it is, moreover, a slightly smaller bird, and there is less white on the secondaries. The sexes are alike. Length 7.5 in. [191 mm.]. After the autumn moult the plumage assumes a more

¹ As the type of the genus *Tringa* is the Green Sandpiper, the generic name *Tótanus* should by strict priority be superseded by *Tringa*.

olive-brown hue than in summer, and the lustre of the upper parts is wanting. The young bird is olive-brown above, barred with black and reddish brown. The young in down is yellowish grey above, with a narrow black line down the middle from the bill to the tail; under parts dull white; iris hazel; bill greenish olive above, yellow beneath, the tips of both mandibles black; feet pale yellowish flesh-colour; claws black. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in North America from North-west Alaska, the Barren grounds and Mackenzie River valley, east to Ungava, Labrador, Newfoundland, Nova Scotia, New Brunswick, and Prince Edward Island, and south to South California, Louisiana, Texas, Arizona, and South California. Winters from California, Louisiana, and S. Carolina to Peru and S. Brazil. Of the many reported occurrences in the British Isles, only seven or eight seem to be above suspicion; while the only continental records are from Heligoland. [F. C. R. J.]

SOLITARY-SANDPIPER [*Tótanus solitarius* (Wilson); *Tringa solitaria*, Wilson].

1. **Description.**—Distinguished from the common-sandpiper by its smaller size, in having the rump coloured like the back, not white, while the bars on the axillaries and under wing-coverts are much wider; and there are no bars on the primaries. Length 8 in. [203 mm.]. The adult in breeding plumage has the upper parts uniform olive-brown, with a slight bronze gloss spotted with white; the central upper tail-coverts and the rump dusky blackish; lateral upper tail-coverts whitish, barred with black; throat white, streaked with brown on the sides; lower throat and sides of the neck also streaked with brown; remainder of under surface of body uniform white, except the under tail-coverts which are barred with black; iris brown; bill greenish black; eyelids dark grey; feet greenish grey; claws brownish black. The adult in winter lacks the white spots on the upper surface, and is more uniform. [W. P. P. and T. W.]

2. **Distribution.**—Although there is reason to believe that this species is widely distributed in North America during the breeding season, the only reliable nesting records are from Alberta, where it was found nesting first in 1903. It probably also breeds in New Brunswick, Quebec, Ontario, and many other districts. Apparently it is replaced by an allied race in British Columbia and Alaska. In winter this species migrates southward, and winters from the West Indies south to Argentina (Rio Plata). It has also been recorded from Greenland and Bermuda, and five times in Great Britain, chiefly on the south coast. [F. C. R. J.]

YELLOWSHANK [*Tótanus flavipes* (Gmelin); *Tringa flavipes* (Gmelin). Lesser-yellowlegs].

1. **Description.**—Distinguished from the greater-yellowshanks by its much smaller size and the black colour of the rump feathers, which are edged with white. Length 9 in. [228 mm.]. The adult in breeding plumage has the upper parts black, each feather being spotted on its margin and tipped with dull white; lower back and rump black, each feather fringed with white; upper tail-coverts white, barred with black; tail white at the base, becoming brownish towards the tip; all the feathers barred with brownish black; under surface of the body, including the axillaries, white, streaked on the sides of the face and chest and barred on the flanks with brownish black; lateral under tail-coverts barred with black; primaries brown, shaft of first primary white; iris dark brown; bill black; feet bright yellow. After the autumn the black markings of the upper parts are wanting. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in North America from Kotzebue Sound, Alaska, North Mackenzie, Central Keewatin, and South Ungava to the valley of the Upper Yukon, South Saskatchewan, and North Quebec. Migrates southward, wintering in Chile, Argentina, and Patagonia, and occasionally in Mexico, Florida, and the Bahamas. It has also been recorded from the Bermudas, Greenland, and the Prybilof Isles, and has occurred three times in Great Britain (Notts, Cornwall, and Fair Island). [F. C. R. J.]

GREATER-YELLOWSHANK [*Tótanus mélanoleúcus* (Gmelin); *Tringa mélanoleúca* (Gmelin). Greater-yellowlegs.

1. **Description.**—Distinguished from the redshanks on the one hand and the yellowshank on the other by the dusky brown coloration of the rump. Length about 14 in. [355 mm.]. The adult in breeding plumage has the upper part brownish grey heavily blotched with black, and with white spots and margins to all the feathers; rump and upper tail-coverts white, barred with brownish black; tail barred with greyish brown and white; primaries uniform blackish brown, the shaft of the first feather being ivory-white; secondaries and their coverts blackish grey, barred and toothed with white; chin white, minutely spotted with blackish brown; fore-neck and upper chest white, streaked with blackish brown; remainder of under surface, including the axillaries and under wing-coverts, white barred with blackish brown. After the autumn moult the black blotches of the upper surface are absent, and the black markings on the chest and belly are absent. [W. P. R. and T. W.]

2. **Distribution.**—Breeds in North America from Lake Iliamna, Alaska, and South Mackenzie to the south of British Columbia, Ungava, Labrador, and Anticosti Island, but in very few cases have the eggs been found. Migrates southward in winter, and winters from S. Carolina, Texas, Louisiana, and Georgia (occasionally also in N. Carolina) south to Patagonia, visiting the Bermudas on migration. One definite (and possibly a second) record from England (Scilly Isles and Warwick). [F. C. R. J.]

DUSKY-REDSHANK [*Tótanus fúscus* (Linnæus); *Tringa erythropus* (Pallas). Spotted redshank. French, *chevalier brun*; German, *dunkelfarbige Wasserläufer*; Italian *gambetta mora*].

1. **Description.**—Differs from the common-redshank in having the bill $2\frac{1}{2}$ in. long instead of $1\frac{1}{2}$ in., as in the latter species, and by the general colour of the upper and under surface, which is greyish black. Length 12 in. [305 mm.]. The top of the head and the general colour of the upper parts is dark greyish black, with spots and bars of brown or white; primaries and their coverts brown, the former white on their inner webs, freckled with brown; lower back pure white; rump, upper tail-coverts, and tail barred with white and black; sides of face, throat, and under surface of body uniform greyish black; under tail-coverts barred with black and white; under wing-coverts and axillaries pure white; iris brown; bill dark brown; basal half of lower mandible dusky red; legs and toes orange-red; claws black. The adult in winter plumage has the upper surface grey, the lower back, rump, and upper tail-coverts white, the latter barred with black; primary coverts and secondaries grey, edged or notched with white; superciliary streak white; sides of face white, streaked with grey; under surface of body white, streaked on the fore-neck with dusky grey. [W. P. R. and T. W.]

2. **Distribution.**—Breeds in Arctic Europe and Asia. In Norway it nests from Vadsö (lat. 70° N.) to about the Arctic Circle; in Sweden in the wooded swamps of North Lapland; in Finland from the north of Finnish Lapland south to Savolax. In Russia, according to Buturlin, it breeds on the tundra of the north of Europe and Asia, but not beyond lat. 72° N., or on the Arctic islands, near Archangel, in the governments of Moscow, Kazan, Perm, and N.E. Orenburg; and in Asia is reported to breed in Turkestan, is common in the Kolyma delta (lat. 69° to $69\frac{1}{2}^{\circ}$), and breeds east to Kamtschatka. Migrating southward through Europe, it winters in the Mediterranean region and Northern Africa, but I can find no authority for the statement that it has been recorded from Cape Colony;¹ and in Asia winters in Mesopotamia, Transcaspia, Persia, India, Burma, China, and Japan. It is an uncommon passage migrant in England, and has occurred under twenty times in Scotland and about twenty times in Ireland. [F. C. R. J.].

¹ Dresser, *Eggs of the Birds of Europe*, p. 714.

TEREK-SANDPIPER [*Terékia cinérea* (Güldenstadt). German, *graue Uferschnepfe*; Italian, *terechia*].

1. **Description.**—Readily recognised by its long bill, which is upturned towards the extremity, and by the black bands down each side of the back, this latter character being present in young examples in their first plumage. The sexes are alike, excepting that the female is less brightly coloured. Total length 9 inches [228 mm.]. General colour of the upper surface ash-grey, heavily streaked on the head and neck with black and more broadly so on the mantle; lesser wing-coverts and scapulars black, the latter forming a well-marked double band down the back; rump and upper tail-coverts barred and mottled with brown; under surface of the body white; throat and upper chest thinly streaked with blackish. [W. P. P. and T. W.]

2. **Distribution.**—In Europe this species only breeds in Northern Russia, and recently has extended its range towards the south-west in Central Russia. It has been found nesting on islands in the Gulf of Bothnia (Finland), the valley of the Onega, the Dwina delta, and lat. 68° on the Petschora, while southward its breeding range extends to Orenburg (lat. 51½°), the Ufa, Kazan, Samara, Simbirsk, Penza, Riazan, and probably also the Novgorod government. In Asia it ranges north to 67° 30' N. on the Ob, about 70° on the Yenisei, and 68½° on the Kolyma, but apparently not farther east. Southward it breeds to about lat. 54° in the Minusinsk district, and 51° in the Alei basin. On migration it passes through Japan, Asia, and the shores of the Caspian and Black Seas to winter in the Malay Archipelago, Australia, and Tasmania, the shores of Southern Asia, North-eastern Africa, and in small numbers in Africa south to Damaraland and Natal. It has also been recorded from Bering Island, Madagascar, and Mauritius, and in Europe casually west to Germany (three), France, Italy (eleven), Switzerland, and four in England (Kent) in 1912. [F. C. R. J.]

REDBREASTED - SANDPIPER [*Macrorhamphus griseus* (Gmelin). Redbreasted - snipe, Dowitcher].

1. **Description.**—Recalls the knot, but differs therefrom in having the bill long, 2 in. [50-80 mm.], straight, equal to or exceeding the tail in length, and expanded at the tip, while the middle and inner toes lack a connecting web. Length 10 in. [254 mm.]. The adult in summer plumage has the general colour of the upper parts black, irregularly barred and margined with rich buff; lower back and rump white, the latter spotted and barred with dull black; upper tail-coverts and tail white, regularly barred with dull black; primary feathers uniform brown; secondaries brown, widely margined on their outer webs with white, inner webs streaked and marbled with white, scapulars like the back; under surface of body light cinnamon rufous, dotted with black, principally on the sides of the breast and flanks; under wing-coverts and axillaries white, barred with dusky black; iris reddish hazel; bill dark olive; feet light yellowish olive. The adult in winter plumage differs in having the upper parts uniform ash-grey with a few blackish shaft-streaks, and in having the under surface of the body white, spotted and barred on the lower throat, sides of the neck, sides of the body, and under tail-coverts with blackish brown. [W. P. P. and T. W.]

2. **Distribution.**—The breeding-grounds of this species are still unknown, but are believed to be to the north or north-west of Hudson Bay. On migration it passes along the Atlantic coast of North America, occasionally through Illinois, Indiana, and Ontario, and winters from Florida and the West Indies south to Northern Brazil. Accidental in Greenland, the Bermudas, France, and about twenty-three records from the British Isles. Replaced by a closely allied race in western North America, which breeds in Alaska, and apparently also in North Alberta. [F. C. R. J.]

SLENDERBILLED-CURLEW [*Numenius tenuirostris* Vieillot. French, *courlis à bec grêle*; German, *dunnschnabeliger Brachvogel*; Italian, *chiurlotello*].

1. **Description.**—Of about the same size as the whimbrel, it is to be recognised at once by having the crown uniformly striated, white axillaries, and a tarso-metatarsus less than 3 inches in length; it resembles the common-curlew in markings, but is smaller; under surface of the body white, with blackish streaks on the chest and throat, and with rounded black spots on the flanks. [W. P. P. and T. W.]

2. **Distribution.**—Although formerly believed to breed in Western Europe, this species is now known to nest in Siberia. Buturlin states that it nests on the steppes of Kherson, the governments of Taurida, Ekaterinoslav, Kharkov (sparingly), Stavropol, and Orenburg. In European Russia it is rare and local, but on the Irtysch River in the Tobolsk government it appears to be common, and also breeds in the Turgai and Uralsk governments. On migration it passes westward, wintering in the Mediterranean region and North Africa, west to S. France, Spain, Algeria, etc., and occasionally wandering to Germany (four), Heligoland (one), Holland (three), Belgium (three), North France, and at least three times to England (Kent, 1910). In Africa it apparently ranges south to Abyssinia. [F. C. R. J.]

ESKIMO-CURLEW [*Numenius borealis* (Forster)].

1. **Description.**—Distinguished from all the other curlews by the inner webs of the primary quills, which are uniform in colour (*i.e.* no bars), and the hexagonal reticulations along the back of the tarso-metatarsus. It is the smallest species of the group. Length $14\frac{1}{2}$ in. [368 mm.], culmen $2\frac{1}{2}$ in. The adult has the upper parts of a blackish brown, each feather with buff-coloured spots on its outer margin; as these spots become abraded and wear away very quickly, the upper parts become very dark in consequence; tail and longer secondaries brownish ash barred with blackish brown; primaries uniform dark brown; throat whitish; lower throat, chest, and sides of the body and under tail-coverts rufescent buff, mesially streaked and faintly barred with blackish brown; middle of the breast and belly tawny buff; under wing-coverts and axillaries reddish buff barred with dull black; iris dark brown; bill brownish black, lower mandible flesh-colour at the base; feet greyish blue, nails black. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in North America, and has at present only been found nesting in the Barren grounds of Northern Mackenzie, east of Fort Anderson. It has, however, been met with near Ungava Bay and in Alaska. On migration it passes through Canada and the United States east of the Rocky Mountains, and winters in South America, from the Galapagos Islands and Chile to Brazil, Paraguay, Argentina, and Patagonia. It has also occurred in Greenland casually, and in the Falkland Isles, and seven or eight times in the British Isles. For some reason, the numbers of this species have greatly diminished of late years, and it is thought possible that it may become extinct. [F. C. R. J.]

THE BUSTARDS¹

[ORDER: *Gruiformes*. FAMILY: *Otididæ*]

LITTLE-BUSTARD [*Otis tetrax* Linnæus. French, *outarde canepetière*; German, *Zwergtrappe*; Italian, *gallina prataiola*].

1. **Description.**—Distinguished by its small size, it being the least of all the European bustards. Length 17 in. [432 mm.]. The male in full summer plumage has the general colour of the upper parts black, barred and irregularly marked with rufous; top of the head paler;

¹ Vol. iii. p. 541.

throat and cheeks slaty blue; a white ring encircles the upper neck, passing down the fore-neck in an ever decreasing line till it meets in a point on the lower neck, which is deep black, succeeded by a broad semicircular white band, followed by an equally wide semicircular band of black; chest, belly, and under parts white. The female slightly more mottled above, and lacking the coloured pattern on the neck; chin whitish; fore-neck and chest rufous buff, the former with black margins to the feathers, and the latter with three bands of black; rest of the under parts white; middle tail feathers coloured like the back, with three distinct black bars; outer tail feathers white, with two black bars, the interspaces marked with black spots and blotches; iris reddish brown; bill horn-coloured, black at the tip; legs ochreous yellow. [W. P. P. and T. W.]

2. **Distribution.**—Breeds chiefly in the Mediterranean region and Western Asia. It nests in North-West Africa, from Morocco to Tunisia; the Iberian Peninsula, Sardinia, Sicily, S. Italy, the Balkan Peninsula, Southern and Central France, Central Germany sparingly, Austria and possibly also Hungary, the lower Danube valley, and Russia in the Podolsk, Kief, Poltava, and perhaps the Tambov, Saratov, Samara, and Oldenburg governments, north to 49° on the Emba and 54° in the Akmolinsk government. In Asia it breeds in Transcaspia, the Tomsk government, and east to Zaissan-Nor, Central Asia, and probably also Cyprus. It wanders occasionally to Scandinavia, Denmark, the Baltic Provinces, Finland, and Ingermannland in Russia, and northern birds are migratory, and appear in winter in North-West India, Mesopotamia, etc. Has occurred fairly frequently in the British Isles, chiefly on the east and southern counties of England. [F. C. R. J.]

MACQUEEN'S BUSTARD [*Houbara undulata*¹ *macqueeni* (Gray and Hardwicke); *Otis macqueeni* Gray. Asiatic ruffed-bustard or houbara. German, *asiatische Kragentrappe*; Italian, *oubara asiatica*].

1. **Description.**—May be recognised at a glance by the long crest, and the black and white ruff. Length 26 in. [660 mm.]. Adult male—general colour above reddish buff, very finely vermiculated with black, each feather having one or two bars of black mixed with buff, giving the upper parts a speckled and barred appearance; head, with a sparse crest about 2½ inches long, of black and white feathers; each side of the neck ornamented with a frill of long feathers (about 4½ inches long), white on the basal half, black on the terminal; chin, throat, belly, under wing-coverts, and axillaries pure white; lower neck minutely freckled with black and rufous buff; chest covered with a long and dense ruffle of slate-grey feathers; under tail-coverts white, with three bars of black; tail coloured above like the back, with three or four bars of silver-grey, the interspaces marbled and freckled with black; iris pale greenish yellow; legs yellowish grey, with a dull greenish tinge. The adult female is similar, but is rather smaller, and with the crest and ruff less developed. [W. P. P. and T. W.]

2. **Distribution.**—In Europe this species is only known to breed in S.E. Transcaucasia, and possibly also in the Kirghis steppes. In Asia its breeding range extends from the deserts of Syria, Arabia, Mesopotamia, Transcaspia, and Turkestan north to lat. 51° N., and east to Zaissan-Nor, the Tomsk government, and the foot of the Altai range, and through Persia to North-west India, Afghanistan, and Sind. As a straggler it has occurred in many parts of Europe, West Russia (Finland, Livonia, and Poland), Germany, Sweden, Öland, Bohemia, Holland, Belgium, France, Italy, and four times in Great Britain (Lincoln, Yorks (two), and Aberdeen). In winter it ranges into S. Persia and India. [F. C. R. J.]

¹ As only one race of this species has occurred in the British Isles, the trinomial should not be used, but in this case is adopted to avoid confusion with the N. African race, *H. undulata undulata*.

THE CRANES

[ORDER: *Gruiformes*. FAMILY: *Gruidæ*]

CRANE [*Megalórnis grús* (Linnæus); *Grús communis* Bechstein. French, *grue*; German, *Kranich*; Italian, *gru*].

1. **Description**.—Has the top of the head and face densely covered with black bristles, a patch of rough red skin on the hinder part of the crown, back of the head and nape greyish black; from the eye backwards down the sides of the neck the plumage is white; throat and fore-neck black from thence downwards, and the plumage generally is ash-grey; primary flight-feathers black, the secondaries are elongated and curled, grey tipped with black; tail grey, merging into blackish towards the tips; iris reddish; bill greenish horn towards the tip and lighter green at the base; legs blackish grey. Length 45 in. [1143 mm.]. The sexes are alike in coloration. The nestling is covered with soft down; upper parts brownish, becoming rufous brown on the head, back, and rump; under parts light reddish brown. [W. P. P. and T. W.]

2. **Distribution**.—At present the crane breeds very sparingly in Andalusia, and it is said also in the marshes of Venetia, apparently in Macedonia and Bosnia, and not uncommonly in the lower Danube; in Germany in the northern provinces, especially Prussia, Silesia, and Pomerania, but sparingly also in other districts; in Russia over the greater part of the country north to lat. 68°; in Finland except in N. Lapland, and in Norway and Sweden. In Asia it ranges from Asia Minor east to West Siberia and Turkestan, while farther east it is replaced by an allied race. European birds migrate south to North-west Africa and Abyssinia. In England it formerly bred, but has not nested since about 1600, and is now only an irregular visitor in winter to the British Isles. Casual on the Færoes. Asiatic birds winter in India, China, Japan, etc. [F. C. R. J.]

[AMERICAN BROWN-CRANE [*Megalornis canadensis* (L.)].—Is said to have occurred in Co. Cork in 1905. [F. C. R. J.]

[AFRICAN CROWNED-CRANE [*Balearica pavonina* (L.)].—Was shot in Ayrshire in 1871; possibly escaped. [F. C. R. J.]

[DEMOISELLE-CRANE [*Anthropoides virgo* (L.)].—Shot in the Orkneys in May 1863, and a second was seen at the same time, while one was killed at Norfolk in 1899, but possibly escaped birds. It is more likely to reach our shores by natural means than the two preceding species, as it breeds in the Dobrogea and S. Russia, and has occurred in Heligoland, as well as in Sweden, Germany, and often in South Europe. [F. C. R. J.]

THE RAILS¹[ORDER: *Gruiformes*. FAMILY: *Rallidæ*]

LITTLE-CRAKE [*Porzana parva* (Scopoli). French, *poule d'eau poussin*; German, *kleines Sumpfhuhn*; Italian, *schiribilla*].

1. **Description**.—Distinguished from Baillon's crane (*P. pusilla*) by its larger size, by the absence of the white margin to the outer flight-feather, and by its shorter secondaries, which do not reach to the tip of the wing by more than an inch; whereas in Baillon's crane they reach to the end. Length 8 in. [203 mm.]. The male has the upper parts tawny brown, middle of the back and rump black, with a few white spots or streaks; under parts, including the sides of

¹ Vol. iii. p. 555.

the neck, light slaty grey, feathers of the lower abdomen fringed with white. The female differs from the male in having the throat white, the chest, breast, and belly pinkish buff, and the feathers of the lower abdomen barred with greyish black and white; iris red; bill green, red at the base; legs and feet green. [W. P. P. and T. W.]

2. Distribution.—This species breeds on the Continent from lat. 59° in the Russian Baltic Provinces and the governments of Kief, Orel, Tula, Kazan, Simbirsk, Perm, and Orenburg southward. The supposed breeding in South Sweden is doubtful, but it nests in many parts of Germany, in Austro-Hungary, South France, North Italy, and South Russia. In Asia it apparently breeds east to Persia and the Tian Shan range, but not in Siberia. Statements of breeding in Sicily and Algeria require confirmation. As a vagrant it has occurred about forty-four times in the British Isles, and also in the Canaries. It migrates to the Mediterranean region, wintering in North and Tropical Africa, while Asiatic birds range south to Mesopotamia and Sind. [F. C. R. J.]

BAILLON'S CRAKE [*Porzana pusilla* (Pallas); *Porzana bailloni* (Vieillot). French, *poule d'eau de Baillon*; German, *Zwergsumpfhuhn*; Italian, *schiribilla grigiata*].

1. Description.—Distinguished from the spotted-crake (see vol. iii. p. 557) by its uniform dark grey chest, its dark green instead of orange bill, and barred under tail-coverts. It resembles the little-crake, but is smaller, and has the outer marginal web of the first primary *white*. Length 7 in. [178 mm.]. Upper parts dark brown, the feathers of the hind-neck, back, rump, and secondary coverts with a broad mesial streak of black spotted and margined on the outer web with white; wings and tail brown, the first flight-feather margined on the outer web with white; eyebrows, cheeks, throat, chest, and belly uniform deep slate-blue; abdomen and under tail-coverts black barred with white. Female similarly coloured, but the under parts are much lighter in colour; iris crimson; bill green, becoming darker towards the tip; legs and feet greenish-olive. Immature birds resemble the adult, but the under surface of the body is dull white obscurely barred with dusky brown. Nestling covered with deep black down. [W. P. P. and T. W.]

2. Distribution.—Although there are no recent records of the breeding of this species in England and it is now only a scarce vagrant, there seems to be little doubt that nests were found in Cambridgeshire in 1858 and in Norfolk in 1866. On the Continent it breeds locally in France, not uncommonly in Holland, and sparingly in Germany to East Prussia, while in Russia it nests in the Crimea, Kharkov, Simbirsk (54½° N.), Orenburg, and possibly in Ufa (Buturlin). Southward its breeding range extends to Andalusia in the Iberian Peninsula, the marshes of Switzerland and N. Italy (though Lilford's statement that it nests in Sicily has not been confirmed) and Austro-Hungary. It is stated also to breed in Algeria, possibly in Cyprus and Egypt, and in Asia apparently east to Persia, but in Eastern Asia and Japan, Africa south of the Sahara, and Madagascar, and in Australia and New Zealand it is replaced by allied forms. In Central Europe it is migratory, wintering south of the Mediterranean to beyond the Sahara, and has occurred in the Canaries and Madeira. [F. C. R. J.]

4. Nest and Eggs.—The nest is a neat little cup of sedges, bits of reeds, etc., lined with finer materials, and is generally placed in shallow water among growing rushes and water-plants, which are often bent over so as to conceal the nest. At other times it may be found on floating scum in deep water or in the sides of dense clumps of broad-leaved sedge. The share of the sexes in building seems not to have been recorded. The eggs are generally 6 to 8 in number, rather elongated in shape, and the ochreous ground is generally almost obscured by dense stippling with rather dark olivaceous brown. They are distinguishable from those of the little-crake by their higher gloss. Average size of 26 eggs, 1.13 × .79 in. [28.8 × 20.3 mm.]. The share of the parents in incubation and the length of the period are not known. In England the first layings were found early in June, and in Hungary from about the middle of May onward, but

in Spain clutches may be taken from the beginning of May. Probably more than one brood is reared in the season, as eggs have been found (incubated) in August in England. [F. C. R. J.]

CAROLINA-CRAKE [*Porzana carolina* (Linnæus). Carolina-rail, Sora-rail].

1. **Description.**—Resembles the common-crake (*P. porzana*), but is at once recognised by its black forehead and throat. The sexes are alike in size and coloration. Length $7\frac{1}{2}$ in. [190 mm.]. General colour of the upper parts olive-brown, with a blackish spot in the middle and whitish margins to the feathers of the mantle and scapulars; base of the forehead black, bordered with bluish grey, which is continued over the eyes on to the cheeks; lores and throat black, continued in a broad band down the neck, gradually widening out and merging into the blue-grey of the chest and breast; axillaries and flank feathers evenly banded with black and white; under tail-coverts and vent tinged with rust colour; iris bright chesnut; bill yellow; feet yellowish green. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in temperate North America, north to Newfoundland, James Bay, and about 62° N. on the Mackenzie River and British Columbia, and south to Texas. It winters from California and S. Carolina through the West Indies and Central America to S. America. As a casual it has occurred in Greenland several times, also in the Bermudas, and three times in Great Britain (Berks, Glamorgan, and Tiree). [F. C. R. J.]

[ALLEN'S GALLINULE [*Porphyrio alleni* Thompson. Allen's reed-hen. Italian, *pollo sultano dell' Allen*].

1. **Description.**—Recognised by its small size, it being the smallest of all the purple-gallinules. The sexes are alike. Length 12 in. [305 mm.]. General colour above dull olive-green; head purplish blue, becoming lighter on the neck, where it merges into the green of the mantle; quills blackish brown, externally margined with greenish blue; whole of the under surface of the body brownish purple, darkest on the sides of the body; under tail-coverts pure white; axillaries black; under wing-coverts purplish-blue; iris reddish brown; bill dark red; frontal shield dusky; legs and feet crimson. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in Tropical Africa and Madagascar north to Senegal and Abyssinia, and occasionally wandering south to the Transvaal and Cape Colony (once). The one occurrence off the Norfolk coast may be due to an escaped bird, but it has been recorded from the Canaries, several times on the Azores, and also in Southern Europe (Spain, Sicily, Italy, and perhaps S. France). [F. C. R. J.]

[PURPLE-GALLINULE [*Porphyrio cæruleus* (Vandelli)], which breeds in South Europe and North Africa;

[GREENBACKED-GALLINULE [*Porphyrio porphyrio* (Linnæus)];

[INDIAN-GALLINULE [*Porphyrio veterum* Gmelin];

[AUSTRALIAN-GALLINULE [*Porphyrio melanotus* Temminck].

Have been recorded at different times from the British Isles, but all are well known in captivity, and owing to their climbing powers are apt to escape. [F. C. R. J.]

[THE ANDALUCIAN HEMIPODE OR BUSH-QUAIL, *Turnix sylvatica* (Desfontaines), which breeds in S. Spain and North-Western Africa, and is a sedentary species, is said to have occurred three times in England, but probably in every case the occurrence was due to an escape from captivity. [F. C. R. J.]

THE VULTURES

[ORDER: *Accipitres*. SUBORDER: *Falcones*. FAMILY: *Vulturidae*]

GRIFFON-VULTURE [*Gyps fulvus* (Hablizl); *Gyps fulvus* (Gmelin). French, *vautour fauve*; German, *Gänsegeier*; Italian, *grifone*].

1. **Description.**—Recognised by its large size and bare head and neck. Total length about 48 in. [1220 mm.]. The sexes are alike. Head and neck scantily clothed with white hair; encircling the neck is a ruff composed of white down, thicker on the hind-neck; general colour of the upper parts brown; wings and tail rather darker; under surface of the body brownish buff, darkest on the upper breast, each feather with narrow, pale shaft-stripes; iris hazel; bill slate-coloured; legs light brown. The young birds have the ruff reddish like the rest of the under parts. [w. p. p. and t. w.]

2. **Distribution.**—Breeds in the Mediterranean region and Western Asia, but is replaced by allied forms in India and parts of Africa. In Europe it breeds in the mountain ranges of the Iberian Peninsula, the Pyrenees, Sardinia, the Maritime Alps, Sicily, Greece, Turkey, Bulgaria, Roumania, Bosnia, Herzegovina, Montenegro, Transylvania, Hungary, Slavonia, and Dalmatia, also in S. Russia to about 50° N. in the Urals. In Asia it nests in Asia Minor, Crete, Cyprus, Palestine, Transcaspia, Turkestan, and east to India, where it is replaced by the Himalayan race. It also breeds in Northern Africa from Morocco to Tunisia and into the Sahara, as well as in Egypt and the Nile valley. It has occurred in N. France, Holland, Germany, and Ireland as a casual (Co. Cork, 1843), and has once been seen in England. [F. C. R. J.]

EGYPTIAN-VULTURE [*Néophron percnopterus* (Linnæus). French, *vautour d'Égypte*; German, *schmutziger-Aasvogel*; Italian, *capovaccajo*].

1. **Description.**—Differs from the griffon-vulture in its much smaller size, and by its white coloration. Length 25 in. [635 mm.]. The sexes are alike. Head, neck, excepting a few whitish feathers in front of the eye, the whole of the plumage white, sometimes stained with rusty, as are the long neck-hackles; primary flight-feathers blackish, secondaries brown; tail graduated; iris red; terminal part of bill black, basal part and the naked head orange; legs and feet livid flesh; claws black. The young bird has the general colour blackish brown, the feathers tipped with fulvous. As the bird advances towards maturity the plumage becomes more ochraceous, and finally turns white. [w. p. p. and t. w.]

2. **Distribution.**—This species has a wider breeding range than the griffon. In Europe it nests in Spain, Portugal, the Pyrenees, S. France, till quite recently at Mt. Salève in Switzerland, in Italy, Dalmatia, Bosnia, Herzegovina, Montenegro, occasionally in Transylvania, in Bulgaria, Roumania, Turkey, Greece, and in Russia in the Bukowina, Crimea, Dneister valley, and the Caucasus. In Asia it ranges from Asia Minor, Palestine, Arabia, and Transcaspia east through Persia, Turkestan, Afghanistan, etc., to North-west India. In Africa it is found not only in the Canaries, Cape Verde Isles, and North-west Africa, but also in Egypt and the Nile valley, and in many other parts of Africa apparently to the south. It has occurred as a casual in Madeira, Germany, Norway, and three times in England (two obtained, Somerset and Essex). In Europe it is migratory, wintering in Africa. [F. C. R. J.]

THE EAGLES¹

*[ORDER: *Accipitres*. SUBORDER: *Falcones*. FAMILY: *Buteonidæ*. SUBFAMILY: *Aquilinæ*]

GREATSPOTTED-EAGLE [*Aquila maculata* (Gmelin). French, *aigle tacheté*; German, *grosser Schreiadler*; Italian, *aquila anatraia maggiore*].

1. **Description.**—Differs from the golden-eagle chiefly in its smaller size and in that the feathering of the tarso-metatarsus does not extend to the base of the toes. The sexes are alike in coloration, but the female is larger. Length 27 in. [686 mm.]. Whole of the plumage blackish brown, the upper parts in freshly moulted specimens being glossed with purple; primary flight-feathers darker brown; tail uniform dark brown, the middle pairs being washed with greyish towards the tip; legs feathered to the base of the toes with short, dense feathers of a blackish brown colour; iris brown; bill dark horn; cere yellow; feet yellow. The young bird is densely marked with brownish buff spots, which are conspicuously large, and ovate in shape, on the scapulars and wing-coverts; under surface of body deep brownish black striped with tawny brown. [W. P. P. and T. W.]

2. **Distribution.**—The breeding range of this species in Europe includes Russia south of about lat. 56° N., Livonia in the Baltic Provinces, and apparently Poland, locally in Hungary, Transylvania, rarely in Croatia, commonly in the Balkan States, in Turkey, and perhaps also in Greece. In Asia it also breeds in Asia Minor, Palestine, and from South-west Siberia and Turkestan east to Central and North India and China. On migration it visits North-east Africa and Southern Asia, south to Arabia, India, and Burma, while in Western Europe it is only a rare casual. Either this or possibly the lesserspotted-eagle, *Aquila pomarina* (Brehm), has occurred eight or nine times in England and twice in Ireland, but the specimens require critical examination. [F. C. R. J.]

THE GOSHAWKS²

[ORDER: *Accipitres*. SUBORDER: *Falcones*. FAMILY: *Buteonidæ*. SUBFAMILY: *Accipitrinæ*]

GOSHAWK [*Accipiter gentilis gentilis* (Linnæus); *Ástur palumbárius* (Linnæus). French, *autour*; German, *Habicht*; Italian, *astore*].

1. **Description.**—Resembles the sparrow-hawk, but may be recognised at a glance by its greatly superior size, proportionately shorter, thicker legs, and the heavily barred under parts. The sexes differ only in that the female is somewhat larger. Length 23 in. [583 mm.]. The general colour of the upper parts is of an ash-grey, darker on the head, which displays an ill-defined white superciliary stripe. The primaries, which are dark brown, are faintly barred with blackish brown on their inner webs, while the tail feathers are crossed by three or four blackish bands and a terminal white band. The under surface is white, heavily barred with black save on the throat, where fine longitudinal streaks are more conspicuous than bars. The abdomen and under tail-coverts are white. The immature plumage differs conspicuously from that of the adult, many of the feathers of the upper parts having more or less well-marked fringes of white, while the under parts are creamy white, relieved by very conspicuous, drop-shaped streaks or longitudinal stripes of brown; iris, cere, and legs yellow. [W. P. P. and T. W.]

2. **Distribution.**—Formerly the goshawk must have bred in small numbers in Great Britain, and as late as 1893 a nest and eggs were found in Yorkshire, though there is no record of breeding for about ninety years previously. On the Continent it has a wide distribution,

¹ Vol. iv. p. 78.

² Vol. iv. p. 105.

breeding in Scandinavia up to the forest limit and in Russia to about the latitude of Archangel. From these limits southward it is found in the wooded districts south to Andalusia in Spain, Italy, Sicily, Greece, and the Caucasus. In Sardinia and apparently Corsica it is replaced by an allied race, and other forms inhabit various districts in Northern Asia and North America. At the present time it can only be considered as a rare vagrant to Great Britain, three Irish records being of doubtful authenticity. [F. C. R. J.]

4. **Nest and Eggs.**—Like the sparrow-hawk, the goshawk uses the old nest of some other species for a foundation, but builds a very substantial nest of its own on the top, composed of sticks and twigs, and often lined with fresh green shoots of spruce or other tree, according to locality. It apparently does not, however, make a fresh nest every year, for Saunders states that the old nest is used year after year, presumably when undisturbed. The share of the sexes in building seems not to have been recorded. The eggs are generally 3 to 5 in number, usually 4 (but Alléon says that seven young have been found in a nest), and I have seen a complete clutch of 2 only. In colour they are bluish white or pale blue, without gloss, often unmarked, but occasionally showing faint rusty spots or streaks. Average size of 50 eggs, 2.25×1.76 in. [57.2×44.9 mm.]. They are laid at intervals of a couple of days, as is usually the case with raptorial birds. Naumann speaks of a three weeks' incubation period, but it probably lasts considerably longer, though accurate information is lacking. The hen seems to perform most if not all of the duty of incubation, though the male may possibly take a small share. Exceptionally eggs may be found in Middle Europe towards the end of March, but more usually in the first half of April, and about the same time in South Europe, while in the north of Europe they are often not laid till May. Only one brood is reared in the season. [F. C. R. J.]

AMERICAN-GOSHAWK [*Accipiter gentilis atricapillus* (Wilson)].

1. **Description.**—Differs from the common-goshawk in having the upper parts slate-grey and the whole of the under surface freckled with slate-grey. The sexes are alike, excepting that the female is larger. Length 22 in. [558 mm.]. General colour above bluish ash colour; primary quills blackish brown obscurely barred with black; tail similar in colour to the back, crossed with four or five indistinct bands of brownish black; top of head black, separated from the black ear-coverts by a white supercilium; under surface of body white, evenly freckled all over with slate-grey; vent and under tail-coverts white. The young resemble that of the preceding species, *Accipiter gentilis*. [W. P. P. and T. W.]

2. **Distribution.**—A North American species, which is said to have occurred twice in Ireland and once in Scotland, but further evidence as to its presence is desirable. It breeds over the greater part of North America north of the United States northern border, and is replaced by an allied race on the western side from California to Alaska. [F. C. R. J.]

THE HONEY BUZZARD ¹

[ORDER: *Accipitres*. SUBORDER: *Falcones*. FAMILY: *Buteonidæ*. SUBFAMILY: *Perninæ*]

HONEY-BUZZARD [*Pernis apivorus* (Linnæus)]. Bee-hawk. French, *buse bondrée*; German, *Wespenbussard*; Italian, *falco pecchiariolo*].

1. **Description.**—Recognised by the extremely dense and short feathering on the lores, in having the tarsus feathered for half its length, and in having the nostrils long, narrow, and oblique. The sexes are alike, excepting that the male bird is rather smaller than the female. Length 23 in. [584 mm.]. The coloration is very variable; the most common type has the

¹ Vol. iv. p. 123.

forehead, sides of the head, lores, and ear-coverts ashy grey, gradually merging into the dark brown of the upper parts. A small black crest is usually apparent. The feathers of the upper parts have white bases; tail brown, with two and sometimes three bands of brownish grey; outer aspect of quills greyish brown; inner webs white, barred and freckled with greyish brown; under parts white, some of the feathers with blackish shaft-stripes, widening out at their extremities into a spatulate black marking; axillaries white, banded with brown; iris golden yellow, or sometimes red; cere lead colour; bill blackish; legs and feet yellow. The immature may be recognised by having the tail irregularly mottled and barred with ashy brown. [W. P. P. and T. W.]

2. Distribution.—Formerly this species was an annual, though local summer, visitor to us, breeding regularly in the New Forest, and not infrequently in large woods in other parts of England, such as Herefordshire (last in 1895). Amongst other counties in which it has been recorded as breeding may be mentioned Bucks, Northampton, Oxford, Warwick, Stafford, Salop, Yorkshire (?), Cumberland, Durham (last in 1899), Aberdeen, and East Ross. On the Continent it breeds chiefly in Northern and Middle Europe and West Siberia, and is replaced by allied forms in East Siberia and some districts of Tropical Asia. In Norway it is chiefly confined to the south-eastern part of the country, but in Sweden breeds from Skåne to lat. $67^{\circ} 26' N.$, while in Finland it ranges north to Pudasjärvi and Tornea, and in Russia is very rare near Archangel, and in the Perm government ranges to lat. $58^{\circ} N.$ From these limits southward it is thinly distributed in the wooded districts south to North Spain, the Pyrenees, N. Italy, Hungary, and Transylvania, the Dobrogea (rarely), and in Russia from Bessarabia through Little Russia and the governments of Voronezh and Simbirsk to the Urals. In Asia it also breeds in West Siberia. European birds winter in Tropical Africa and Madagascar, while Asiatic birds winter in India. [F. C. R. J.]

4. Nest and Eggs.—The nest of this species is generally placed in some deciduous tree, such as oak or beech, and though in some cases constructed by the birds themselves is often only the deserted nest of some other bird, such as the common-buzzard. One characteristic which is always present is the lining of fresh green leaves and small branches, generally of the beech, which is renewed from time to time. The share of the sexes in building seems not to be recorded. The eggs are generally 2 in number, sometimes only 1, and rarely 3. They are somewhat rounded in shape, and are extremely handsome, the white or ochreous ground being often quite obscured by deep chestnut brown or brownish red, sometimes very dark; in other cases boldly blotched, and generally showing some smears. Average size of 100 eggs, 2.0×1.62 in. [50.8×41.1 mm.]. They are laid at intervals of some days. The incubation period is apparently unknown, but both sexes have been proved to take part in incubation, though probably the greater part of the work is done by the female, which has a fairly large "brooding spot." The breeding season is late, eggs being rarely found before the last days of May or early in June in Middle Europe, and about the same time in Scandinavia. Only one brood is reared in the season. [F. C. R. J.]

THE KITES¹

[ORDER: *Accipitres*. SUBORDER: *Falcones*. FAMILY: *Buteonidae*. SUBFAMILY: *Milvinae*]

BLACK-KITE [*Milvus korschun* (Gmelin); *Milvus migrans* (Boddart). French, *milan noir*; German, *schwarzer Milan*; Italian, *nibbio nero*].

1. Description.—Distinguished from the common-kite by its shorter and less forked tail, which is brownish ash instead of rufous. The sexes are alike in coloration, excepting that

¹ Vol. iv. p. 121.

the female is somewhat larger. Length 22 in. [558 mm.]. Crown and sides of the head and nape white, mesially streaked with black, remainder of upper surface ash-brown; primary flight-feathers brownish black, freckled on their inner webs with ash-brown; tail brownish ash tinged with rust colour, with eight or nine indistinct bands of black; throat white, mesially streaked with blackish brown; breast rufous brown, with blackish shafts to the feathers; iris greyish, with a yellowish tinge surrounded by a black line; legs pale yellow; claws black. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in Central and Southern Europe, North-West Africa and Western Asia. In North-East and Tropical Africa and in various parts of Asia it is replaced by allied races. In Europe it nests commonly in Spain, also in Southern France, Germany, Switzerland, Italy, Austro-Hungary, the Balkan Peninsula (but not proved to breed in Greece), and Russia from the Baltic Provinces and the Olonetz government south to the Caucasus. In Asia it breeds from Palestine, Asia Minor, and Transcaspia east apparently to the Lena. In Africa it is common on the Cape Verde Isles and from Morocco to Tunisia, north of the Atlas range. To Europe the black-kite is a summer migrant, and winters in Africa, ranging to S. Africa, and, according to Newton, Madagascar. As a casual it has occurred twice in Great Britain (Northumberland and Aberdeen), and also in Denmark, Sweden, and Finland. [F. C. R. J.]

[BLACKWINGED-KITE, *Elanus caeruleus* (Desfontaines).—Is said to have been shot about 1862 in Co. Meath, but the evidence is insufficient. One is said to have occurred in N. France. [F. C. R. J.]]

[AMERICAN SWALLOWTAILED-KITE, *Elanoides forficatus* (Linnæus).—Is said to have occurred several times in Great Britain. It inhabits North and South America, but has not been recorded from the Continent, and further evidence is desirable before it can be admitted. [F. C. R. J.]]

THE FALCONS¹

[ORDER: *Accipitres*. SUBORDER: *Falcones*. FAMILY: *Falconidæ*]

ICELAND-FALCON [*Fälco rusticolus islandus* Brünnich. German, *Isländischer Jagdfalke*].

1. **Description.**—Differs from the gyr-falcon in having the head white, streaked with black. The sexes are alike, except that the male is smaller than the female. Length 22 in. [558 mm.]. General colour of the upper parts greyish brown, all the feathers barred and tipped with white; tail greyish brown, with about twelve transverse bars of white; throat uniform pure white; remainder of the under parts white, the breast feathers with a longitudinal strap-streak of black, terminating in an oval spot, while the flanks are heavily barred with black; iris dark brown; cere, orbits, and feet yellow. The Iceland-falcon is, moreover, a larger and more stoutly built bird than either the gyr or Greenland-falcon, the tail is proportionally shorter, the wings longer, and the head much larger. [W. P. P. and T. W.]

2. **Distribution.**—Breeds on cliffs in Iceland, where it is resident, but occasionally strays in winter to the British Isles. [F. C. R. J.]

GYR-FALCON [*Fälco rusticolus rusticolus* Linnæus; *Fälco gyrfälco* Linnæus. French, *gerfaut*; German, *Jagdfalke*].

1. **Description.**—Distinguished from the Iceland-falcon by the uniformly slate-coloured head and dark moustachial streak. The sexes are alike in coloration and markings, but the female is larger than the male. Total length about 20 in. [507 mm.]. General colour

¹ Vol. iv. p. 133.

of the upper parts greyish brown, with greyish black bands; feathers below the eye and sides of the neck blackish grey; throat white; remainder of the under surface white, with broad longitudinal streaks of black, the flanks barred with the same colour; iris dark brown; bill slate, black at the tip; cere and feet yellow. [W. P. P. and T. W.]

2. Distribution.—Breeds only in Northern Scandinavia and Lapland; in Norway generally in Finnmark, on the coast as well as in the fjeld, and also in the Telemark fjeld; in Sweden in the wilder parts of the high fjeld from Lapland to Jemtland; also on the borders of Finnish Lapland and Russian Lapmark and on the Murman coast. As a vagrant it has occurred in the Baltic Provinces, Poland, N. Germany, Heligoland, Holland, Belgium, Denmark, and at least twice in England (Sussex, 1845, and Suffolk, 1867). It is also said to have strayed to Iceland and N. America. [F. C. R. J.]

AMERICAN PEREGRINE-FALCON [*Falco peregrinus anatum* Bonaparte. Duck-hawk].

1. Description.—Distinguishable from the common-peregrine by the absence of the oval spots on the breast, characteristic of the latter species. The sexes are identical, excepting that the female is slightly the larger bird. Adult, total length 15 in. [380 mm.]. [W. P. P. and T. W.]

2. Distribution.—Breeds in North America from Norton Sound, Alaska, N. Mackenzie, Boothia Peninsula, and West Greenland south to Lower California, Arizona, Texas, and S. Carolina. Replaced along the north-west coast by a closely allied race. It is a migratory species, and winters from southern British Columbia to the West Indies, Panama, and South America. It has occurred twice in England (Leicester, 1891, and Lincoln, 1910). [F. C. R. J.]

REDFOOTED-FALCON [*Falco vespertinus* Linnæus. Orangelegged-hobby. French, *faucon à pieds rouges*; German, *Rotfussfalke*; Italian, *falco cuculo*].

1. Description.—The male of the redfooted-falcon can be recognised at a glance by the rich chesnut abdomen, thighs, and under tail-coverts, and the uniform slate-black tail. The sexes are unlike in coloration. Length $11\frac{1}{2}$ in. [292 mm.]. Adult male—above slate-black, becoming lighter on the wings; primary flight-feathers and secondaries silvery grey; shafts of the feathers black; chin, throat, and under parts bluish grey, with very faint black shaft-stripes; lower abdomen, thighs, and under tail-coverts rich chesnut. Adult female—upper parts, including the wings and tail, bluish grey, barred with black; head and under parts reddish chesnut, some of the feathers spotted or streaked with black. [W. P. P. and T. W.]

2. Distribution.—In Europe the species breeds in Hungary, Moravia, Galizia, the Tyrol, Bulgaria, Roumania, and in Russia from the Baltic Provinces (rare), Archangel, and Poland southward. It is also said to have bred near Halle in 1885 and in Saxony. In Asia it breeds from Asia Minor and West Siberia east to the Altai, but is replaced by other forms in East Siberia, Central Asia, and China. Breeding in Cyprus requires confirmation. The western form migrates in winter through Asia Minor, Cyprus, Palestine, and S.E. Europe to Africa, ranging south to Ovampoland, Damaraland, and Great Namaqualand. As a straggler it has occurred as far west as Spain, the Canaries, and about forty-two times in the British Isles. [F. C. R. J.]

LESSER-KESTREL [*Falco naumanni* Fleischer; *Falco cénchris* Naumann. French, *faucon cresserine*; German, *Rötelfalke*; Italian, *falco grillaio*].

1. Description.—Differs from the common-kestrel (see vol. iv. p. 140) in having the claws white. The sexes differ both in size and coloration, the male being the smaller of the two. Length 12 in. [305 mm.]. Head, back and sides of neck, rump, and upper tail-coverts and tail of a

uniform pearl-grey, the latter submarginally banded with deep black and tipped with white; mantle and back uniform deep cinnamon rufous, as also the lesser and median wing-coverts; primary flight-feathers dark brown; throat buffish white; remainder of the under parts, including the axillaries, vinous buff, each feather with a spot of black towards the tip, giving these parts a spotted appearance; axillaries and under wing-coverts white, spotted with black. The adult female resembles the female of the common-kestrel, but has the claws white, and has the barring of the plumage more sharply defined, while the ground colour is of a brighter hue; iris dark brown; bill bluish horn-colour, black at the tip; cere, orbits, and feet yellow; nails white. [W. P. P. and T. W.]

2. Distribution.—Breeds in the Mediterranean region and Western Asia. It nests plentifully in Southern Spain, and also breeds in Southern Italy, Sicily, and Sardinia, Styria, Carniola, Dalmatia, Croatia, Herzegovina, Montenegro, Bulgaria, Turkey, Greece, Crete, Poland according to Taczanowski, but this seems to require confirmation, South Russia and the Crimea. In Africa it breeds from Morocco to Tunisia, and in Asia from Asia Minor, Cyprus, Palestine, Persia, and Turkestan to Bokhara. In China it is replaced by an allied race. In winter it migrates south through Mesopotamia, Arabia, Egypt, and North-west Africa to Tropical Africa, occasionally ranging south to Cape Colony and Natal. East Asiatic birds winter in India. As a straggler it has occurred in N. France, N. Germany, and about ten times in the British Isles (eight times in England, and once each Scotland and Ireland). [F. C. R. J.]

THE GEESSE¹

[ORDER: *Anseriformes*. SUBORDER: *Anseres*. FAMILY: *Anatidae*. SUBFAMILY: *Anserinae*]

LESSER WHITEFRONTED-GOOSE [*Anser finmarchicus* Gunner; *Anser erythropus* (Linnaeus). German, *Zwerg-Gans*].

1. Description.—Distinguished from the whitefronted-goose (see vol. iv. p. 153) by its smaller size and by the white on the forehead, which is more extensive, and reaches to a line between the eyes on the top of the head. The sexes are alike in coloration, but the female is smaller. Length 21 in. [533 mm.], culmen about 1·3 [33 mm.], wing 14·5-15 [367-380 mm.]. [W. P. P. and T. W.]

2. Distribution.—Breeds in Northern Scandinavia, Russia, and Siberia; in Norway in Finmark and in S. Varanger and the Tana valley; in Sweden chiefly on the high fjeld of North Lapland, but south to Karesuando and Quickjoek; in N. Finland chiefly in the Kilpisjärvi, Enontekis, Enare, and Utsjoki districts; and in Russia on Kolguev, Novaya Zemlia, and the Kanin Peninsula (Buturlin). In Asia it is found on the lower reaches of the Ob, Yenisei, Lena, Yana, and Kolyma (rarely), as well as on the Taimyr Peninsula and in Chukchiland. Its normal winter quarters are Japan, China, Mongolia, India (rarely), Turkestan, and the shores of the Caspian, while it occurs in great numbers in North Russia west to the Baltic Provinces on migration, and also visits Eastern and South-eastern Europe, occasionally straying west to Germany, the Low Countries, France, and Spain. Two definite records at least from England (Northumberland and Norfolk), and others somewhat doubtful. Also recorded from Egypt. [F. C. R. J.]

SNOWGOOSE [*Anser hyperboreus hyperboreus* Pallas; *Chén hyperboreus* Pallas. White-wavey. French, *oie de niege*; German, *Schnee-Gans*].

1. Description.—Recognised by its white plumage, with the exception of the primary feathers, which are black for the terminal two-thirds and light grey at the base; primary

¹ Vol. iv. p. 151.

coverts ash-grey; iris dark brown; eyelids whitish; feet purple or orange-red; soles of the feet dingy yellow. Length 23 in. [584 mm.]. The sexes are alike. [W. P. P. and T. W.]

2. **Distribution.**—This small form of snowgoose breeds in Arctic eastern Asia and western Arctic America; in Asia commonly from 165° 8' E. long. eastward, apparently also in the New Siberian Isles, the estuaries of the Lena, Yana, etc.; and in N. America chiefly north of the Arctic Circle in Alaska, the Barren grounds of the lower Mackenzie, and Liverpool Bay. In America it migrates south along the western side to Lower California and Mexico, while in Asia it ranges south to Japan, and occurs not uncommonly on the Caspian and the Volga, while stragglers have occurred in Norway, Germany, Heligoland, France, Holland, Greece, and a good many have been observed, and about seven obtained, in the British Isles. [F. C. R. J.]

GREATER-SNOWGOOSE [*Anser hyperboreus nivālis* Forster].

1. **Description.**—Similar to the snowgoose, but larger, having a total length of 33 to 36 in. [838-914 mm.], a bill of 2½ in., a wing of 17½ in., a tail of 6 in., and the tarsus from 3¼ to 3½ in. Otherwise it exactly resembles the last-named species. [W. P. P. and T. W.]

2. **Distribution.**—It seems probable that this race breeds in Northern Greenland, and also on Southampton Island and in James Bay, Hudson's Bay, Ellesmere Land, etc., but when Arctic America is more fully explored probably its breeding range will be found to be widely extended over the north-east. It migrates south through eastern North America as far as Louisiana, Florida, Texas, Porto Rico, and Cuba, and as a casual visitor has once occurred in Ireland (Co. Mayo, 1886). [F. C. R. J.]

REDBREASTED-GOOSE [*Branta ruficollis* Pallas; *Bernicla ruficollis* Pallas. French, *bernache à cou roux*; German, *Rothals-Gans*].

1. **Description.**—Distinguished at a glance by its strongly contrasted plumage of black, red, and white. The sexes are alike in coloration, but the female is smaller. Length 21 in. [533 mm.]. The general coloration may be described as black, enlivened on the head with a large patch of white in front of the eye, and a large white area extending from the hinder half of the head down each side of the neck, in the centre of which is a patch of rich chesnut; the back of the neck is black, the lower part of the neck and the prepectoral area are of a rich chesnut, set off by a circular white band, sharply dividing the red from the black areas; a white band runs along the top of the flanks, and the upper and under tail-coverts and abdomen are white; iris hazel; beak, legs, and toes black. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in western Arctic Asia from the lower Ob to the Yenisei and Taimyr Peninsula. It has occurred in North Russia (Novaya Zemlia, Archangel, and Lapland), and migrates up the valleys of the Ob, Irtysh, and Ural to the Kirghis steppes, Syr Darya, the lower Volga, Turkestan, Transcaucasia, and the southern Caspian and Aral Seas. It has also occurred at Irkutsk; and in Europe not only passes through N. Russia, but stragglers have occurred in Italy, Germany, Austro-Hungary, Sweden, Denmark, Holland, about seven times in England, and has also visited Egypt. [F. C. R. J.]

LIGHTBREASTED-BRENT-GOOSE [*Branta bernicla glaucogastra* (Brehm)].

1. **Description.**—Distinguished from the typical form *Branta bernicla* (see vol. iv. p. 158) only by the lighter colour of the belly and the pearl-grey instead of brown-grey flanks. The general tint of the upper parts is, moreover, somewhat lighter. [W. P. P. and T. W.]

2. **Distribution.**—This form of the brent breeds in the Arctic islands of north-eastern North America, from the west coast of Greenland west to about long. 100° W. in the Parry group, and north of about lat. 73° to as far as land is known to extend. It certainly breeds in Ellesmere

Land, and is said to do so south of these limits. Migrates south along the Atlantic coasts to Carolina and even Florida, occasionally straying inland, and has been recorded in small numbers on the coasts of southern British Columbia and Vancouver Island. Has occurred on the Taimyr, and apparently on Kolguev, and apparently in some numbers in the British Isles. [F. C. R. J.]

BLACK-BRENT [*Branta bernicla nigricans* (Lawrence)].

1. **Description.**—Resembles the brent-geese, *B. bernicla* (see vol. iv. p. 158), but on the whole is considerably darker. The sexes are alike in coloration and markings. Length 22-29 in. [558-728 mm.]. Head, neck, upper part of the body and chest dark brownish black; the white collar on the neck broader than in the brent-geese, and always connected in front, and generally behind; belly and sides of the body black; abdomen and vent pure white; upper and under tail-coverts white. The young bird has the white neck-ring obscurely defined, the greater and secondary coverts with white tips, and the feathers on the flanks greyish brown without the white tips of the adult. [W. P. P. and T. W.]

2. **Distribution.**—This race breeds in western Arctic America and Arctic Asia east of the Lena. In Alaska it appears to be confined to the northern coast and islands, and in Asia breeds not only on the northern coast but also on the islands in Bering's Sea. On migration it visits the western coasts of America south to Lower California, and has occurred on Hawaii, while in Asia it is found along the eastern coasts and islands to Japan. It is said to have been obtained eighteen times in England, including one flock of fourteen birds from the Wash, 1909. [F. C. R. J.]

[CANADA-GOOSE, *Branta canadensis* (L.).—Another N. American species which now lives with us in a state of semi-domestication, and has been naturalised for over two hundred years; but there is no evidence that any of the specimens obtained have reached us by natural means from America. [F. C. R. J.]]

[EGYPTIAN-GOOSE, *Chenalopez ægyptiacus* (Linnæus).—Inhabits the Nile valley and Palestine; also occurs in our islands, but is frequently kept in captivity, and all occurrences are probably due to escaped birds. [F. C. R. J.]]

[SPURWINGED-GOOSE, *Plectropterus gambensis* (Linnæus).—Inhabits Tropical Africa; has occurred also in these islands; but its presence is undoubtedly due to escapes from confinement. [F. C. R. J.]]

[INDIAN BAREHEADED-GOOSE, *Anser indicus* (Latham).—Also said to have once occurred in England. Probably this bird had also escaped. [F. C. R. J.]]

THE SWANS¹

[ORDER: *Anseriformes*. SUBORDER: *Anseres*. FAMILY: *Anatidæ*. SUBFAMILY: *Cygninæ*]

[AMERICAN TRUMPETER-SWAN, *Cygnus buccinator*, Richardson.—There is some evidence that this species was obtained in Suffolk in 1866, but the specimen in question is immature, and more evidence is desirable. [F. C. R. J.]]

[AMERICAN WHISTLING-SWAN, *Cygnus columbianus* Ord.—This species is stated to have been identified among dead game in shops in Edinburgh. Both this and the preceding

¹ Vol. iv. p. 171.

species breed in Arctic N. America, but the former has a more southerly range than the latter. [F. C. R. J.]

THE DUCKS¹

[ORDER: *Anseriformes*. SUBORDER: *Anseres*. FAMILY: *Anatidæ*. SUBFAMILY: *Anatinæ*]

RUDDY-SHELDUCK [*Castroca ferruginea* (Pallas); *Tadorna castroca* (Linnæus). French, *tadorne casarca*; German, *Rost-Ente*].

1. **Description.**—May at once be distinguished by the almost uniform chesnut coloration and the black feet and beak. The sexes are alike, except that the female lacks the black collar round the neck. Adult male and female—top of the head whitish buff, gradually merging into the dark chesnut of the upper parts; lower back whitish buff, freckled with black; rump, upper tail-coverts, and tail black; throat chesnut-buff; remainder of the under parts rich reddish chesnut, excepting the middle of the belly, which is deep chesnut; wing-coverts white; secondaries black, glossed with dark bronze-green on the outer web, forming a speculum; iris dark brown; bill, legs, and feet blackish. [w. p. p. and t. w.]

2. **Distribution.**—This species breeds locally from the Mediterranean and Black Sea regions and Western Asia through temperate Asia to China and Japan. It breeds in Africa, in Morocco, Algeria, and possibly also Egypt; in Europe from S. Spain (rarely) to Greece, Macedonia, Eastern Bulgaria and Roumania, and Russia (Crimea, Caucasus, Transcaucasia, the Volga to lat. 54° N., the Astrakhan, Samara, Saratof, Ufa, and Orenburg governments). In Asia it nests from Palestine, Asia Minor, and Transcaspia through Persia, Afghanistan, the Pamirs, S. Tibet, and the Himalayas, north to the Altai, Dauria, the Lena to 60° N., Mongolia, China, and east to Japan. It migrates in winter to North Africa and Southern Asia, ranging south to the White Nile in Africa and to the Persian Gulf, the plains of India, Ceylon, Burma, S. China, and Formosa. Has occurred as a casual in most European countries, north to Norway, Sweden, and Finland, and west to Denmark, the British Isles (in some numbers), Iceland, and Greenland. [F. C. R. J.]

AMERICAN GREENWINGED-TEAL [*Nettion crecca carolinense* (Gmelin); *Anas crecca carolinensis* Gmelin].

1. **Description.**—Closely resembles the common-teal, from which, however, it is distinguished, in the case of the male, by the vertical band of white at the base of the neck, which crosses the wrist of the wing when closed; further, the white lines which run from the base of the beak backwards, and above and below the post-ocular patch of green, are here only barely traceable, while the cream-coloured stripe which runs along the outer border of the scapulars in the common-teal is in this species wanting. The female is barely distinguishable from the female common-teal, but in the greenwinged-teal the flank feathers are marked with V-shaped loops, and the scapulars are more or less distinctly barred. Iris hazel; beak blackish; legs and toes brownish. [w. p. p. and t. w.]

2. **Distribution.**—This is the representative form of the teal in North America, where it is widely distributed, breeding from the Arctic Circle (Hudson's Bay to Alaska and the Aleutian Isles) south to the northern United States. In winter it visits the United States, ranging south to Lower California, Mexico, Honduras, and the West Indies. As a casual it has occurred in Hawaii, the Bermudas, Greenland, and two or three times in England (Devon, Yorks, and perhaps Hants). [F. C. R. J.]

AMERICAN BLUEWINGED-TEAL [*Querquedula discors* (Linnaeus); *Anas discors* Linnaeus].

1. **Description.**—The male of the American bluewinged-teal may be at once distinguished by the broad crescent-shaped white band between the eyes and the bill, and the greyish blue wing-coverts. The sexes differ in coloration. Length 15 in. [380 mm.]. In the adult male the forehead and top of the head are of a deep glossy black; sides of the head, face, and neck dark lead-colour, relieved by the broad band of white just referred to; mantle and shorter scapular feathers dark brown, with V-shaped markings of pinkish buff; lower back, rump, and upper tail-coverts dark brown, fringed with dark lead-colour; under surface of body pinkish red, thickly spotted on the chest and flanks with black, and evenly barred with black over the remainder of the under surface; under tail-coverts and tail black; a large pure white patch on each side of the tail; long scapulars black, mesially streaked with pinkish buff; lesser wing-coverts and outer webs of some of the scapulars slate-blue; greater coverts white, forming the upper border of the speculum; iris brown; bill black; feet yellowish. Adult female—upper parts blackish brown, fringed with yellowish white; sides of the face and neck white, streaked with black; throat white; under parts whitish, each feather with a black-brown spot in the middle; wing-coverts slate-blue, whereby the female of this species is at once distinguished. [W. P. P. and T. W.]

2. **Distribution.**—Also breeds in North America, both in Canada and the United States, north to Labrador and the Saskatchewan, but rarely north of lat. 60°, and chiefly east of the Rockies and south to Florida and Mazatlan, as well as abundantly in the Mississippi valley. It winters in the southern United States and south to the West Indies, Mexico, Central America, and South America to Ecuador. As a casual it has occurred in the Bermudas, Denmark (once), and two or three times in the British Isles (Dumfries, Cheshire, and Cork). [F. C. R. J.]

AMERICAN-WIGEON [*Maréca americana* (Gmelin); *Anas americana* Gmelin. Baldpate].

1. **Description.**—Differs from the common-wigeon chiefly in that the general coloration of the head and neck is of a pale buff instead of chesnut. The metallic green spots which bespangle the neck of the common-wigeon are also present in the American species. The flanks in the American species also differ from those of this region in the common-wigeon in being of a vinous chesnut, vermiculated with black. The sexes differ in coloration. Length 20 in. [507 mm.]. In the male the crown is whitish instead of buff, as in the common-wigeon; the upper parts are of a reddish grey, with black vermiculations, while the fore-breast and flanks are of a vinous chesnut, the latter region finely vermiculated with black; the lower breast and abdomen are white; under tail-coverts black, glossed with green; the secondaries, which form the speculum, are black glossed with metallic green; the major coverts white, tipped with black, forming the superior border of the speculum; while the long inner secondaries are glossy greenish black, and have a silvery white outer margin. The female differs from that of the female of the common-wigeon in having the head lighter and more coarsely marked, and the speculum much more intensely coloured. [W. P. P. and T. W.]

2. **Distribution.**—This North American species breeds from Kotzebue Sound in Alaska, and thence along the Arctic coasts east to Hudson's Bay (but more commonly south of lat. 68°), south to the northern States of the Union. It winters south from the southern United States to Mexico, Guatemala, Costa Rica, the West Indies, and Hawaii. It is said to have been found breeding in Iceland, and has occurred as a casual in France (once), and at least three times in Great Britain (London and Leeds markets and outer Hebrides), as well as on the Azores and once on Bering Island. [F. C. R. J.]

REDCRESTED-POCHARD [*Nétta rufina* (Pallas); *Nyróca rufina* (Pallas). French, *canard huppé* or *espagnol*; German, *Kolben-Ente*; Italian, *germano turco*].

1. **Description.**—Identified, the male by its conspicuously red beak, red head and neck, and red legs, and the female by the greyish white colour of the secondaries and the blaze of white along the inner primaries when the wing is closed. Length 21 in. [533 mm.]. The head and neck in the male are of a vinous chesnut; the feathers of the crown elongated to form a more or less marked crest; the neck and under parts are black; the back smoke-grey, relieved by a large white patch on the "shoulder" of the wing; there is also a conspicuous white area on the hinder flanks. The smoke-grey scapulars are tinged with chesnut. The major coverts are white tipped with black, and form the dorsal border of the pink-tinged white speculum formed by the secondaries; iris reddish brown; beak and legs carmine. The female is easily recognised by reason of the greyish white colour of the secondaries, which have an indistinct bar of dark brown across their tips, and the blaze of white which runs down the primaries in the closed wing. [W. P. P. and T. W.]

2. **Distribution.**—This species breeds locally in the Mediterranean region and east to Central Asia, exceptionally also in Central Europe. In North Africa it breeds in Algeria and probably also in Tunisia, while in Europe it nests in Central and Eastern Spain locally, the Camargue in S. France, Mallorca, Sardinia, Sicily, possibly in S. Italy, the Dobrogea in Roumania, and in Russia in the governments of Kherson, Ekaterinoslav, Taurida, the lower Don, the Caucasus, Transcaucasia, the Volga north to 53½° N. and north to the Ufa government (Buturlin). It has also bred sporadically in various parts of Germany, and exceptionally in the Banat (S. Hungary). In Asia it breeds from the Kirghis steppes, Transcaspia, and Turkestan east to Shiraz in Persia, Yarkand, and the S.W. Tomsk government in Siberia. It winters in the Mediterranean region and North Africa, South-west Asia south to the Persian Gulf, India, Ceylon, the Shan States, and Burma. Casual in Northern Europe (Baltic provinces of Russia), Denmark, Holland, Belgium, N. Germany, N. France, and rarely in the British Isles, though flocks of thirteen and four occurred in 1906. Has occurred once in the New York market, U.S.A. [F. C. R. J.]

FERRUGINOUS-DUCK [*Fulígula nyróca* (Güldenstädt); *Nyróca nyróca* (Güldenstädt). Whiteeyed-duck. French, *fuligula nyroca*; German, *Moor-Ente*; Italian, *moretta tabaccata*].

1. **Description.**—Recognised by the rich chesnut head and neck, and the small white spot on the chin. The sexes are alike in coloration, but the female is duller. Length 16 in. [406 mm.]. Adult male—head, throat, chest, and sides of the body rich reddish chesnut, a triangular white spot on the chin, neck surrounded by a blackish collar; back, scapulars, rump, and upper tail-coverts blackish brown, freckled with chesnut; middle of the belly and under tail-coverts white; lower abdomen blackish brown, vermiculated with white; secondaries white, broadly tipped with black, forming a speculum; primaries white, the outer ones margined and tipped with black, and the inner ones tipped only with black; axillaries and under wing-coverts white; iris white; bill and legs lead-colour. The adult female is similar to the male, but the chesnut of the head is duller, and the brown chest suffused with white, gradually merges into the white belly. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in North Africa and throughout Europe, except in the north and north-west; also in Asia east to the Ob valley and Kashmir. In Africa it nests in Marocco, Algeria, and probably Tunisia, while in Europe it is common in South Spain; but statements of breeding in France require confirmation, and those from Denmark, Belgium, and Holland are unsatisfactory. It does, however, breed locally in Germany, and also in Italy and Sicily, Hungary, Galizia, Slavonia, Herzegovina, Montenegro, Greece (probably),

Bulgaria, Roumania, and in Russia from Poland, near Tjumen and the S. Perm government southward. In Asia its breeding range extends from Transcaspia and South-west Siberia to Turkestan, the Tian-Shan and the Kashmir Lakes. It winters in Northern Africa south to Abyssinia, and in Asia from Palestine and Asia Minor, the Persian Gulf, and India east to Arrakan, Burma. Casual in Iceland; and visits the Canaries, and has occurred about a hundred times in the British Isles. [F. C. R. J.]

BAER'S POCHARD [*Fuligula baeri* (Radde); *Nyroca baeri* (Radde)].

1. **Description.**—Recognised by the black head and neck glossed with green, and the white spot on the chin. The male and female are much alike in coloration. Total length 18 in. [457 mm.]. In the male the head is black, glossed with oil-green, excepting a white spot on the chin; fore-neck and chest rich chesnut; belly and under tail-coverts white; the flanks and vent dark brown finely waved with white; upper parts deep blackish brown, washed with a greenish lustre, and finely vermiculated with red; secondaries and their major coverts white, edged and tipped with blackish brown; iris white; bill, legs, and feet black. The adult female resembles the adult male, but is not so brightly coloured, especially about the head, which is dull black, and with a chesnut patch in front of the eye. [w. p. p. and t. w.]

2. **Distribution.**—This species breeds in East Siberia; apparently in Kamtschatka, Ussuria, the valleys of the Central Amur, and the Argun rivers. On passage and in winter it occurs in Japan, China, irregularly to North-east India and Burma, and also from the Waigiu Islands near New Guinea. One record from England (Herts, 1901). [F. C. R. J.]

BUFFLEHEADED - DUCK [*Clangula albeola* (Linnæus); *Nyroca albeola* (Linnæus). Spirit-duck, dipper].

1. **Description.**—Resembles the goldeneye, but may be distinguished by the fact that the nostrils are placed nearer to the base of the bill than to the tip, while the coloration is no less distinct. Length 14 in. [355 mm.]. The male differs from the female goldeneye in being much smaller, in having a large, oval, white patch behind and rather below the eye, instead of in front thereof, and in the absence of the longitudinal white band formed by the scapulars. Further, the fore-part of the head has a metallic green gloss, the rest purple: in the goldeneye the whole head is glossed with purple. The female differs from the female goldeneye in having an oval white patch behind the eye. [w. p. p. and t. w.]

2. **Distribution.**—A North American species, breeding north to the Yukon River in Alaska, the lower Mackenzie River, Great Slave Lake, and north-east from Manitoba to Hudson's Bay. It is said to nest in Ontario, and possibly in New Brunswick (?). Southward it breeds in N. Dakota, Montana, and N. Ohio. It winters from the Aleutian Isles and British Columbia south to Lower California, Mexico, and Florida, and has occurred casually in Cuba, the Bermudas, Newfoundland, Nova Scotia, Greenland (twice), at least twice in England (Norfolk and Yorks), and also on the Hawaiian Isles. [F. C. R. J.]

HARLEQUIN - DUCK [*Histrionicus histrionicus* (Linnæus); *Cosmonetta histrionica* (Linnæus). French, *canard histrion*; German, *Kragen-Ente*].

1. **Description.**—The male can readily be distinguished by its general slate-blue colour, enlivened with patches of chesnut and bars of white. The sexes differ in coloration. Length 17 in. [432 mm.]. The slate-blue colour of the male varies in intensity, being almost black on the crown and back. There is a large patch of chesnut on the flanks, and a loop of

the same hue on the crown, enclosing a longitudinal bar of black running backwards along the crown from the beak. A broad band of white surrounds the fore-part of the face extending upwards in two narrow white lines on each side of the median black bar just referred to; there is a broken bar of white on the side of the neck, and a white black-bordered collar, and a white black-bordered crescent on each side of the base of the neck; the scapulars are white, and the major coverts are tipped with white; the upper and under tail-coverts are black. The female is of a dull clove-brown above, whitish brown below, and this coloration is relieved only by an indistinct patch of white on the side of the head, and a more or less distinctly white area around the base of the beak. [W. P. P. and T. W.]

2. Distribution.—Breeds in Iceland, North-east Asia, and North America. In Europe there is no certainly known breeding-place except Iceland, and Sabanaeff's statement that it nests in the Urals is apparently erroneous. In Arctic Asia, however, Buturlin states that it breeds from Lake Baikal to Saghalien and Kamtschatka, north to about 65° N., and that he met with it in the Verkhoyanski Mountains and the Upper Kolyma. It also breeds in N. America from the Kuriles and Aleutian Isles, Alaska east to Hudson Strait, Greenland, Labrador, and Newfoundland, while southward it ranges in the Rocky Mountains to Montana. In winter it occurs rarely in Europe; four times in England (Yorks, one; Northumberland, three), also in Sweden, N. Russia, Germany, N. Italy, and Switzerland; in Asia to Korea, Japan, etc.; and in America to the middle States of the Union and California. [F. C. R. J.]

KING-EIDER [*Somatéria spectabilis* (Linnæus). French, *canard à tête grise*; German, *Pracht-Ente*].

1. Description.—Distinguished at a glance by the upgrowth of the side of the beak, which rises in the form of a great tongue-shaped plate far above the level of the culmen. The sexes differ conspicuously. The male has the crown and occiput lavender-grey, the side of the head a delicate sea-green. The area surrounding the tongue-shaped crest of the beak and the throat are black. The fore-neck is of a pale cinnamon, the back white, and the wing-coverts white. The scapulars, breast, flanks, and abdomen are black, but there is a large white patch on each side at the base of the tail. Iris yellow; beak reddish orange; legs and toes orange-red. The female differs from that of the common-eider in that the feathers of the side of the beak are not continued forward beyond the level of the feathers at the base of the culmen. Iris yellow; beak greenish brown; legs and toes ochreous. [W. P. P. and T. W.]

2. Distribution.—Bullock stated that he found a nest in 1812 on Papa Westray in the Orkneys, but further confirmation is requisite before this record can possibly be accepted. The supposed case of nesting on Iceland, recorded by Faber, though less improbable, is by no means satisfactorily proved. It does, however, nest sparingly on Spitzbergen, and, according to Buturlin, also on Kolguev, and in some numbers on Novaya Zemlya; while in Asia it breeds along the northern shores of Siberia (Kanin and Yamal Peninsulas, Taimyr, Great Liakoff Isles, lower Lena and Kolyma) eastward, according to Buturlin, to the Commander Isles and Kamtschatka. In America it breeds on the northern shores of Greenland and on the Labrador coast; also on the Arctic coasts and islands of N. America west to Alaska, where it breeds sparingly, and north to lat. 82° 27' in Grinnell Land (H. W. Feilden). On migration it occurs on the Scandinavian coasts, the Færoes, in the Baltic and N. Russia, as well as casually in Germany, Denmark, France (twice), Italy (four times), etc.; while in America it usually ranges south to the Great Lakes and the north-eastern United States, but has occurred casually south to California, Georgia, and Iowa. In England six occurrences, Scotland fifteen or twenty, and Ireland five. [F. C. R. J.]

STELLER'S EIDER [*Polysticta stelleri* (Pallas); *Somatéria stelleri* (Pallas). German, *Scheck-Ente*].

1. **Description.**—In Steller's eider the feathering of the face is not continued forward on to the sides of the beak, the cutting edge of which is produced into a distinct angle near its tip. The sexes differ conspicuously in coloration. Length 16 in. [406 mm.]. The male is white, with a patch of pale sea-green in front of the eye, and a black occiput. The throat, middle region of the neck, and the mid-dorsal line of the body to the tail form a continuous black area, glossed with purple; the outer scapulars are long and sickle-shaped, black, with a sub-median stripe of buff; the wing-coverts are white; the secondaries are of a glossy purplish black, tipped with white, forming a speculum in the closed wing; the prepectoral region is of a golden buff colour, shading into chesnut-buff on the breast and flanks, and blackish brown on the abdomen; iris dark brown; beak lead-colour; legs and toes dark lead-colour. [W. P. P. and T. W.]

2. **Distribution.**—The breeding-grounds of this species lie within the Arctic regions of both Asia and North-west America. In Europe it was said formerly to breed on the Varanger Fjord and the Murinan coast, but the records were generally discredited. More recently, however, Goebel has stated that a few pairs breed off the Ribatchi Peninsula, and possibly it also nests on Novaya Zemlya. In Asia it breeds on the Arctic coast of Siberia from the Taimyr east to Kamtschatka, and in America in small numbers on the northern coast of Alaska, and possibly also on the Aleutian Isles, though the main breeding-grounds lie much farther northward. It has occurred in Europe regularly on the coasts of Scandinavia and the Baltic, and occasionally in Denmark, Germany, France (once), and Heligoland (four times); while in Asia it not only ranges some distance southward, but also winters in numbers in the Kuriles and Commander Isles. In America enormous numbers visit the Aleutian chain in winter, and on the east side it has been met with in Quebec, and once in W. Greenland. Two occurrences in England (Norfolk and Yorks). [F. C. R. J.]

SURF-SCOTER [*Oidémia perspicillata* (Linnæus). Spectacled, skunkheaded, or hollow-billed-coot (N. America). German, *Brillen-Ente*].

1. **Description.**—Distinguished by the fact that the feathering at the base of the beak extends forward to a point reaching to the hinder border of the nostril. The sexes differ conspicuously in coloration. Length 18 in. [457 mm.]. The male is entirely black save a white bar across the forehead, a white band down the back of the neck; iris yellow; beak crimson, with a black oval patch on each side near its base. The female recalls the female of the common-scooter, but differs in having a white patch both before and behind the eye, and in the more uniform coloration of the under parts, which are without perceptible markings. [W. P. P. and T. W.]

2. **Distribution.**—This species is only known to breed in the northern parts of North America, and perhaps also in Eastern Siberia. The statement that it nests in Newfoundland seems to lack confirmation, but Audubon found it nesting in Labrador, and it probably breeds in the Hudson's Bay district. Its main breeding-grounds must be somewhere near the Barren grounds of the Anderson River and the Arctic coasts of Alaska, for enormous flocks of males are to be met with off the coasts in the breeding season, but up to the present few nests have been found. Breeding is said to have once taken place in Greenland, but this also requires confirmation. In Asia, Buturlin states that it is found in the Tchukchi Peninsula, and probably it also breeds there. In winter its migration range in America extends south normally to S. Carolina, and exceptionally to Florida, the Bermudas, and Jamaica on the east side; on the west from the Aleutian Isles to Lower California. It is also a casual in Greenland,

and in Europe has been recorded from the British Isles about twenty-six times; the Færoes (one obtained), Norway, Sweden (two), Finland (three), Heligoland (one), France (several), etc. [F. C. R. J.]

HOODED-MERGANSER [*Mergus cucullatus* Linnaeus].

1. Description.—The large semicircular crest surmounting the crown in both sexes at once distinguishes the hooded from any other mergansers. The sexes differ conspicuously in coloration. Length 18 in. [457 mm.]. The male has the upper parts of a glossy black, relieved on the crest by a large semicircular patch of white. The major coverts are tipped with white, and the long inner secondaries are falcated with a silvery white band running down the shaft. The breast is white, and there is a crescentic bar of white on each side of the fore-breast, and the flanks are of a reddish brown vermiculated with black. The iris is yellow, the beak black, and the legs and toes are yellowish brown. The female recalls that of the merganser, but is distinguished therefrom by the large erect crest and the brown coloration of the upper parts; iris hazel; bill black; legs and toes dusky. [W. P. P. and T. W.]

2. Distribution.—In the breeding season this species is confined to North America, where it is widely distributed. Its northern range extends to central British Columbia, Great Slave Lake, Central Keewatin, Central Ungava, and Newfoundland. It is abundant in N. Manitoba, and is also common in the Rocky Mountains and British Columbia. Southward its breeding range extends to Oregon, New Mexico, Louisiana, and Florida. On migration it occurs in winter from the south of British Columbia to Lower California, Mexico, the Gulf States, and Cuba, and has occurred casually in Alaska and Bermuda. The only European occurrences on record are all from the British Isles (North Wales, Cork (two), and Kerry). [F. C. R. J.]

THE FLAMINGO

[ORDER: *Ciconiiformes*. SUBORDER: *Phoenicopterī*. FAMILY: *Phoenicopteridæ*]

FLAMINGO [*Phoenicopterus roseus* Pallas. French, *flamman*; German, *rosenfarbiger Flamingo*; Italian, *flamanti*].

1. Description.—Apart from the peculiar character of its beak (see Classification), the flamingo is to be readily distinguished by its extremely long and slender neck and long, stork-like legs and webbed toes. The sexes are alike in coloration, though the female is smaller. Length 50 in. [1270 mm.]. The general coloration is of a pale pink, shading into a dark rose-pink on the wings, save the remiges, which are black. The iris is dark brown; the beak yellowish, tipped with black; while the legs and toes are of a lake-red. [W. P. P. and T. W.]

2. Distribution.—Breeds locally in the Mediterranean region and in Southern and Central Asia. Its most westerly breeding-place is on the Cape Verde Isles; except in the dry season it breeds in the Marismas of the Guadalquivir in S. Spain; formerly in the Camargue, S. France, in the lagoons of Tunisia, and also east of Port Said, Egypt. Eastward its chief nesting-places are in the Kirghis steppes, Transcaucasia, the Gulf of Kizil-Agatch, Transcaspia, the Persian Gulf, the Turgai government, and north to about lat. 50° 18' in West Siberia, the Runn of Cutch, India, and in Ceylon. In Europe it has occurred about fifteen times in the British Isles, but most of these were probably escaped birds; and on the Continent it has occurred in France, Germany, Switzerland, and is a migrant to S. Europe, visiting the Balearic Isles and Sardinia, and wintering in Africa, where it has occurred south to Cape Colony. It is said to breed in the Transvaal and Bechuanaland. [F. C. R. J.]

THE HERONS AND BITTERNS¹[ORDER: *Ciconiiformes*. SUBORDER: *Ardea*. FAMILY: *Ardeidae*]**PURPLE-HERON** [*Ardea purpurea* Linnaeus. French, *héron pourpré*; German, *Purpureiher*; Italian, *airone rosso*].

1. **Description.**—Distinguished from the common-heron by the predominant chestnut of the under parts. Total length about 30 in. [762 mm.]. The sexes are alike in coloration. The general colour of the upper parts is brown, slightly glossed with bronze-green; top of the head and back of the neck glossy black, with two elongated white plumes; lower neck reddish chestnut; scapulars and longer secondaries elongated, and disintegrated towards the tips, which are rufous, while the bases of the feathers are grey; wrist of the wing chestnut; lesser and greater coverts washed with the same colour; primaries and secondaries and tail greyish black; throat white; feathers of the chest elongated, creamy buff at their bases, gradually becoming more rufous towards the tip, margined on their inner webs with black; sides of the face and neck bright chestnut, marked longitudinally with black; middle of the chest and abdomen black; sides of the chest deep purplish chestnut; iris pale yellow; upper mandible brownish black; lower mandible brownish yellow, yellow at the tip; cere greenish yellow; tarsi and feet black on anterior face, brownish yellow behind; bare portion of thigh yellow. The adult in winter plumage is similar to the above, but without the two long plumes on the nape, the black nuchal-plumes shorter, and the general tone of the plumage duller. [W. P. P. and T. W.]

2. **Distribution.**—This species breeds in Africa and on the Continent of Europe south of the Baltic. Its northern breeding limits are mid-France, Holland, in small numbers South Germany, commonly in Austro-Hungary, and in Russia on the lower Dniester, Dnieper, the Pinsk marshes, the governments of Kief, Ekaterinoslav, Kharkof, and Voronesh, on the Volga to 48½°, and the lower Ural (Buturlin). From these limits its range extends to the Mediterranean and Black Seas, and also to Sicily, while in Asia it breeds in Asia Minor, Palestine, Mesopotamia, Transcaucasia, and Transcaspia, but from India east to China and the Malay Archipelago it is replaced by an allied race. In Africa it breeds not only in the north, but also in the Canaries (rarely), Madeira, the Cape Verde Isles, and also in South Africa. European birds are migratory, wintering in Africa. As a casual visitor it has been obtained in Scandinavia, Heligoland (once), N. Germany, and about fifty times in the British Isles, chiefly on the south-east coast of England. [F. C. R. J.]

GREAT WHITE-HERON [*Egretta alba* (Linnaeus); *Ardea alba* Linnaeus. Great white-egret. French, *aigrette blanche*; German, *Silberreiher*; Italian, *sgarza*, *airone bianco maggiore*].

1. **Description.**—Distinguished from the little-egret by its much larger size [wing 15½ in., 393 mm.], and by having the bill shorter than the middle toe and claw. The sexes are alike in coloration. The whole plumage is pure white, the bill black; from the middle of the back springs a dense bunch of filamentous plumes, reaching far beyond the tail; another patch of feathers, greatly elongated and similar to those of the back, falls from the sides of the neck and breast; iris yellow; bill black; lores and orbital skin pale green; feet black. The adult in winter differs only in that it is devoid of the ornamental plumes and has the beak yellow. [W. P. P. and T. W.]

2. **Distribution.**—In Europe this species only breeds in the south-east; once in Silesia (1863); in three localities in Hungary, formerly in Slavonia, in Servia, Montenegro, Albania, Roumania, and Bulgaria, and in S. Russia, in Bessarabia, the lower Dniester and Dnieper, the

¹ Vol. iv. p. 326.

governments of Kief, Ekaterinoslav, and Kharkof, on the Volga to $48\frac{1}{2}^{\circ}$ N., the lower Ural, and possibly in the S. Perm government (Buturlin). In Asia it breeds in Asia Minor, Syria, Mesopotamia, Turkestan, and in West Siberia to at least 47° N., but the birds from India, through East Asia and the Malay Archipelago to Australia, appear to belong to an allied race, and this is also apparently the case with the forms which breed in Tropical Africa and America. European birds are migratory, and probably winter in Africa. As a casual visitor it has been recorded from the Baltic Provinces, Poland, Sweden, N. Germany, Holland, N. France, at least seven times in Great Britain (five England, two Scotland), commonly in Spain, also in Corsica, Italy, Malta, and on the Azores, and in Africa has been met with south to Cape Colony. [F. C. R. J.]

LITTLE-EGRET [*Egrétta garzétta* (Linnæus); *Ardea garzétta* Linnæus. French, *aigrette garzette*; German, *kleiner Silberreiher*; Italian, *sgarzetta*].

1. **Description.**—Distinguished from the great white-heron by its smaller size [wing $10\frac{1}{2}$ in., 279 mm.], and by having the beak longer than the middle toe and claw. The sexes are alike in coloration. The adult in breeding plumage is pure white all over, with two long plumes about 5 in. in length [127 mm.] on the nape; a dense train of decomposed feathers on the back, reaching to but not much beyond the tail, and a similar patch on the chest about 4 in. long [102 mm.]; iris pale ashy yellow, with an outer ring of brownish red; beak black; bare skin round the eye and base of bill whitish fulvescent; tarsi black; feet greenish yellow; joints of toes spotted with black on the upper surface. The adult in winter is similar to the above, but all the ornamental plumes are wanting. [w. p. p. and t. w.]

2. **Distribution.**—Breeds in the Mediterranean region, Africa, and Southern and Central Asia. In Europe there are colonies in S. Spain, Portugal, and a few breed in Italy, Sardinia, and Sicily; formerly it nested in S. France and Greece, and still does so in Dalmatia, Croatia, Herzegovina, Slavonia, and the lower Danube valley, but no longer in Hungary. Not uncommon in Turkey, and in Russia breeds in Bessarabia, the lower Dniester and Dnieper, the Ekaterinoslav and perhaps Kief governments, the Volga delta and lower Urals, as well as Caucasia. In Asia it breeds from Asia Minor, Palestine, and Transcaspia east to China and Japan and south to Mesopotamia, India, and Ceylon, while it is replaced by an allied race in the Malay Archipelago and from the Moluccas to Australia. In Africa it is common from Morocco to Egypt, and also breeds in the Cape Verde Isles, and is resident in S. Africa, breeding in Cape Colony. It has occurred at least once (Devon, 1870) and probably several times in England, and has visited the Azores and Canaries, N. France, Holland, N. Germany, and the Russian Baltic Provinces. [F. C. R. J.]

BUFFBACKED-HERON [*Ardéola ibis* (Linnæus); *Ardea bubûlcus* Audouin. French, *héron garde-bœuf*; German, *Kuhreiher*; Italian, *airone guarda-buoi*].

1. **Description.**—Distinguished by the vinous buff of the dorsal train, the ornamental plumes on the chest, and the long crest on the head. Total length about 18 in. [457 mm.]. The adult male in the breeding season has the whole plumage of the body white, excepting the top of the head, and the ornamental plumes, which are vinous buff in colour; iris pale chrome, darker towards the outer edge; eyelids also pale chrome; bill chrome, paler towards the gape; tarsi and feet dusky. The adult female in breeding plumage resembles the male, but the ornamental plumes are not so fully developed; bill and skin round the eye bright chrome-yellow; legs and feet pale yellow. The adult male and female in the winter are white all over, and lack the ornamental plumes of the head, back, and chest. [w. p. p. and t. w.]

2. **Distribution.**—The only known breeding-places of this species in Europe are in the Marismas of the Guadalquivir in S. Spain, and in Russia in the Aresh district, the Elisabetopol government, and East Transcaucasia (Buturlin). A few pairs may possibly also breed in Sicily.

In Africa it breeds in Morocco, Algeria, and Egypt, and apparently also in S. Africa (Orange River Colony). In Asia it apparently nests in Mesopotamia, but in India and the Malayan Archipelago is replaced by the allied cattle-egret, which also ranges to S. Japan. As a casual visitor it has occurred once in England (Devon, 1805), and also in S. France, Italy, Greece, and Slavonia, and in Africa ranges south to Cape Colony. [F. C. R. J.]

SQUACCO-HERON [*Ardéola ralloides* (Scopoli); *Ardea ralloides* Scopoli. French, *héron crabier*; German, *Schopfreiher*; Italian, *sgarza ciuffeto*].

1. **Description.**—Recognisable at all times by the streaked head and the long crest of black feathers, mesially streaked with buff and margined with white. Length 18 in. [457 mm.]. The adult male in breeding plumage has the feathers of the top of the head and sides of the neck golden buff streaked with black, plumes on the back of the head lengthened into a long crest, whitish buff down the centre, margined on each side with black; mantle and ornamental plumes pale vinous; lower back, rump, and tail pure white; longer scapulars golden straw colour; primaries, secondaries, under wing-coverts, and axillaries pure white; throat white, shading into golden buff on the fore-neck, chest, and upper breast, where the feathers are greatly elongated; lower breast, belly, and under tail-coverts pure white; iris pale chrome; bare skin about the eye, gape, bill, and nostrils bright grass-green; bill for about an inch black, intermediate portion of bill and base bright ashy blue; under surface of tarsi and toes ashy, with a tinge of light chrome about the joints and feet. Adult female similar to the male, but smaller, with a somewhat shorter crest, and the dorsal train not so fully developed. [W. P. P. and T. W.]

2. **Distribution.**—This species breeds in the basins of the Mediterranean, Black, and Caspian Seas, as well as throughout the greater part of Africa. In Europe it nests in South Spain, and has been suspected of breeding in France, in Dalmatia, Herzegovina, Servia, Slavonia, very sparingly in Hungary, Roumania, Bulgaria, and in Russia on the lower Dniester and Dnieper, the Kief and Ekaterinoslav governments, the Crimea and Caucasus, the mouths of the Volga and Ural (Buturlin). In Asia it breeds in Transcaspia, Syria, and Mesopotamia to the Persian Gulf, and it is sedentary in Africa, breeding not only from Morocco to Egypt, but also south to Madagascar and apparently in South Africa. European birds are migrants, wintering in Africa and occurring casually in Central Europe south of the Baltic. It has been recorded from the Azores, in the Canaries, and over sixty times from the British Isles. [F. C. R. J.]

NIGHT-HERON [*Nycticorax nycticorax* (Linnæus); *Nycticorax griseus* (Linnæus). French, *héron bihoreau*; German, *Nachtreiher*; Italian, *nitticora*].

1. **Description.**—Recognised by the glossy bluish black or greenish back. Total length about 18 in. [457 mm.]. The sexes are alike, having the forehead white, continued into a broad superciliary streak; head, back of the neck, mantle, and scapulars black, glossed with dark bluish green; from the back of the neck spring two lengthened narrow plumes of white about 3½ inches long; lower back, rump, upper tail-coverts, and tail grey; throat, cheeks, under wing-coverts, and remainder of under parts white, washed on the sides with delicate grey, which colour surrounds the back of the neck; iris crimson; upper mandible slaty black, with a whitish streak near the edges, central portion of lower mandible flesh colour, greenish towards the base; skin round the eyes pale green; tarsi and feet pale yellow. The adult in the winter plumage is similar to the above, but greener on the head and back, and wanting the white plumes on the nape. The young bird is brownish black above, with large spots of white, and the under surface white heavily streaked with blackish brown. [W. P. P. and T. W.]

2. Distribution.—This species breeds locally in South and Central Europe, as well as throughout the greater part of Africa and Temperate and Tropical Asia to the Sunda Isles. It is represented by allied forms in America. In Europe it breeds in Spain, sparingly in France, formerly in Holland and North Germany, and still occasionally in the latter; in Sardinia, Italy, Hungary, Transylvania, Slavonia, Croatia, Herzegovina, Roumania, Bulgaria, and in Russia (the Podolsk, Kief, Poltava, Kursk, Voronesh, Astrakhan, and Orenburg governments, the lower Don, Ural, and Caucasus). In Asia it breeds from Syria, Asia Minor, and Transcaspia east to China, Formosa, and Japan, as well as in the Moluccas, Sunda Isles, and Borneo, while in Africa it not only nests in North Africa, but also south in small numbers to Madagascar and Cape Colony. In Europe it is migratory, wintering in Africa, while Asiatic birds probably winter in Tropical Asia and Malaysia. As a casual it has been recorded from the Færoes, Azores, Madeira, tolerably often from the British Isles, and on the Continent from Sweden, Denmark, the Baltic Provinces, and Central Russia, as well as on the River Ob in West Siberia. [F. C. R. J.]

AMERICAN-BITTERN [*Botaurus stellaris lentiginosus* (Montagu). Stake-driver, thunder-pump].

1. Description.—Distinguished from the common-bittern by the uniform slaty black primaries (*i.e.* not barred or mottled with rufous as in the common-bittern). General colour of the upper parts brown, barred and freckled on the back and wings with golden buff and black; mantle less freckled, and consequently darker; tail feathers grey, slightly mottled with rufous; head rufous brown; feathers of the back of the head washed with golden buff; back of the neck bare, but concealed by a ruff of golden buff; throat white, with a mesial streak of dark brown, margined with buff, running down the fore-neck on to the chest, where it widens out, giving the whole under surface a heavily striated appearance; lower belly, thighs, and under tail-coverts uniform whitish buff; iris sulphur-yellow next the pupil, shading exteriorly into orange-brownish, narrowly encircled with black; upper mandible olivaceous black; the tomium lemon-yellow; lower mandible pale lemon-yellow; lores and eyelids lemon-yellow, the former divided longitudinally by a medium stripe of dusky olive from the eye to the base of the upper mandible; legs and feet bright yellowish green; claws pale brown, dusky towards their points (Baird, Brewer, and Ridgway). [W. P. P. and T. W.]

2. Distribution.—An American species breeding from Newfoundland to Labrador, Hudson's Bay, lat. 58° and the lower Mackenzie in the north-west, but not in Alaska, though common in British Columbia, and south through the United States to Texas, and wintering south to Guatemala, Cuba, Jamaica, and occurring on passage in the Bermudas. As a casual it has occurred in Greenland, probably in Iceland, about thirty-nine times in the British Isles, once on Guernsey, and also on the Azores. [F. C. R. J.]

[THE GREEN-HERON, *Butorides virescens* (Linnaeus), which breeds in eastern North America and winters from the West Indies southward, and is replaced by allied races in the S.W. States and Lower California, is said to have been shot in Cornwall on one occasion (1889).

1. Description.—The little green-heron may be recognised by its small size, and by having the sides of the head and back of the neck rich chesnut. The adult male in summer plumage has the top of the head glossy greenish black, extending down the back of the neck in a long crest of similar coloured feathers; sides of the neck and upper mantle rich chesnut; dorsal plumes, which entirely cover the back, are long, lanceolate, and of a bright glossy green; scapulars, wing-coverts, and secondaries greenish black, fringed all round with buff or white; primaries deep slate-grey, glossed with green on the outer web; tail glossy green; middle of the throat white; lower throat white, spotted with blackish brown; remainder of the under surface of the body, from the chest downwards, slaty grey tinged with buff; iris and bare part about the eye bright yellow; bill greenish black above, bright yellow beneath; feet greenish

yellow; claws dusky. The adult female is similar to the male, but the ornamental plumes are not so strongly developed. The adults in winter are distinguished by having the long plumes of the back greener, and the purplish bloom on the back of the neck absent. [w. p. p. and t. w.]

THE STORKS

[ORDER: *Ciconiiformes*. SUBORDER: *Ciconia*. FAMILY: *Ciconiidae*]

WHITE-STORK [*Ciconia ciconia* (Linnaeus); *Ciconia alba* Bechstein. French, *cigogne*; German, *weisser Storch*; Italian, *cigogna*].

1. **Description**.—Recognised by its red legs and beak and white plumage. The sexes are alike. Total length about 36 in. [914 mm.]. Primaries, primary coverts, scapulars, greater coverts, and bastard wing black, glossed with green or purple; inner primaries and secondaries powdered with slate-grey on the outer webs; bill dark red; pouch vermilion at the gullet, black anteriorly; iris lemon-yellow; legs and feet reddish pink; claws black. The young resembles the adult, but the quill and scapulars are not so glossy black. [w. p. p. and t. w.]

2. **Distribution**.—This species breeds over the greater part of the Continent, Northern Africa, and Western Asia. It has never bred in a wild state in the British Isles, but on the Continent nests in Sweden sparingly in the south, commonly in Denmark but not in Norway or Finland, in North Germany, and in Russia in the Baltic Provinces, the St. Petersburg, Pskov, Smolensk, Chernigof, and Kharkof governments, becoming scarcer eastward. From these limits southward it is generally distributed over the Continent south to the Mediterranean, with the exception of France and Italy, while in Russia it breeds in the Crimea, and though absent from the N. Caucasus is found in Transcaucasia. Though it does not nest in the Mediterranean islands it is very common in North-west Africa, and also breeds in the Gold Coast Hinterland (Boyd Alexander). In Asia it breeds from Asia Minor, Syria, and Turkestan east into Central Asia (Yarkand), India, and Ceylon, while it has also been found breeding in Rhodesia. Some light has recently been thrown on the winter migratory movements of European birds by means of "ringing." West European birds apparently migrate across the Sahara, and east European and west Asiatic birds through Palestine and the Nile valley to South Africa, south to Cape Colony and Natal. Forty or fifty occurrences in the British Isles, chiefly from East Anglia. [F. C. R. J.]

BLACK-STORK [*Ciconia nigra* (Linnaeus). French, *cigogne noir*; German, *schwarzer Storch*; Italian, *cigogna nera*].

1. **Description**.—Identified from the former by the head, neck, and upper parts, which are black, glossed with green or purple. The sexes are alike in coloration. Total length about 39 in. [990 mm.]. Head, neck, fore-part of the breast, and all the plumage of the upper parts black, with purple and green reflections; chest, belly, and remainder of under parts white; iris reddish brown; naked skin surrounding the eye red; bill red; legs and feet red, with an orange tinge. The young bird differs in being duller, in having the head and neck dull metallic brown, margined with dull white, producing a spotted appearance; the bill and feet olive-green, with a bluish tinge. [w. p. p. and t. w.]

2. **Distribution**.—This species breeds rather sparingly in the forests of South Sweden, but is almost extinct in Denmark, in Germany chiefly in Pomerania and Prussia, but also sparingly in other provinces, in South Spain in small numbers, in Austro-Hungary, doubtfully in Italy, in Bosnia, Roumania, Bulgaria, and Turkey, and in Russia in the Baltic Provinces and the governments of Novgorod, Vladimir, Kazan, and Perm. In Asia it breeds

from Palestine and Asia Minor to Transcaspia, and the Tobolsk and Tomsk governments in Siberia east to Mongolia and China, as well as Dauria and Amuria. Statements of breeding in S. Africa require confirmation. It migrates southward in autumn to Africa, where it ranges south to Cape Colony, and in Asia south to the Deccan in India, Persia, and Mesopotamia. As a casual visitor it has occurred nineteen times in England, and also in Norway and Finland. [F. C. R. J.]

THE TROPIC-BIRD

[ORDER: *Ciconiiformes*. SUBORDER: *Steganopodes*. FAMILY: *Phæthontidæ*]

[REDBILLED TROPIC-BIRD, *Phaëthon æthæreus* (Linnæus).—Is said to have once been found dead in Hereford. [F. R. C. J.]]

THE DARTERS

[ORDER: *Ciconiiformes*. SUBORDER: *Steganopodes*. FAMILY: *Phalacrocoracidæ*]

[AMERICAN-DARTER, *Anhinga anhinga* (Linnæus).—Is said to have been shot once near Poole in Dorset (1851). [F. C. R. J.]]

THE PELICANS

[ORDER: *Ciconiiformes*. SUBORDER: *Steganopodes*. FAMILY: *Pelecanidæ*]

[ROSEATE-PELICAN, *Pelecanus onocrotalus* (Linnæus).—Has occurred in England, but in all cases probably had escaped from confinement. Its nearest breeding-place is the Dobrogea. [F. C. R. J.]]

THE PETRELS¹

[ORDER: *Procellariiformes*. SUBORDER: *Tubinares*. FAMILY: *Procellariidæ*.
SUBFAMILY: *Procellariinæ*]

MADEIRAN FORKTAILED-PETREL [*Oceanódroma cástro* (Harcourt). German, *Harcourts gabelschwänziger Sturmvogel*].

1. **Description.**—Distinguished by the black plumage and the white base of the tail. Length about 7·5 in. [190 mm.]. General coloration of the upper parts dull brownish grey; upper tail-coverts pure white, broadly tipped with dull brownish grey; tail blackish brown, white at the base; wings very long, extending beyond the tail, with the outer webs deep brownish black and the inner webs brownish grey; greater and medium wing-coverts paler; longer flank feathers pure white; bill and feet black. [W. P. P. and T. W.]

2. **Distribution.**—Breeds on isolated rocks both in the Atlantic and Pacific. In the Atlantic it nests on the outlying islets of the Azores, Madeira (Porto Santo and the Desertas), the Salvages, and the Desertas in the Canaries, the Cape Verde Archipelago, and probably St. Helena. In the Pacific it has been met with in the Hawaiian Isles, and probably also breeds in the Galapagos, while a specimen has been obtained in Australia, and as a casual it has occurred in Washington City and in Indiana. In Europe, three specimens have been obtained in England (Kent and Hants) and two in Denmark. [F. C. R. J.]

¹ Vol. iv. p. 380.

WILSON'S PETREL [*Oceanites oceanicus* (Kuhl). German, *buntfürsige Sturmschwalbe*].

1. **Description.**—Distinguished by the yellow on the webs of the feet. The sexes are alike in coloration. Length 7 in. [178 mm.]. General colour of the plumage of the whole body smoky black; upper tail-coverts white; under tail-coverts laterally white, black in the middle; wings and tail black; wing-coverts brownish; a few of the median coverts marked with greyish white, forming an indistinct band across the wing; tail square; iris dark brown; bill black; legs and toes black; basal half of the webs of the toes yellow. [W. P. P. and T. W.]

2. **Distribution.**—This is an Antarctic species, which breeds on Kerguelen, South Victoria Land, the South Shetlands, and South Orkneys. After the breeding season it migrates northward, and has been obtained about twelve times, since it was first reported in 1838, from the British Isles; the Canaries, Azores, and the coasts of Spain, France, and Sardinia on the east of the Atlantic, and along the American coast to the Gulf of St. Lawrence and the mouth of Hudson's Strait (Resolution Island). In the Pacific it has not been met with in the north, but in the Indian Ocean has been recorded from the Mekran coast as well as in the Australian seas. [F. C. R. J.]

FRIGATE-PETREL [*Pelagodroma marina* (Latham)].

1. **Description.**—Recognised by the white line on the forehead reaching from the bill to the eye, and continued through the eye into a broad eyebrow stripe; sides of the face greyish black; top of the head deep smoky brown; mantle, rump, and secondary coverts smoky brown; longer upper tail-coverts grey; basal half of tail grey, terminal half black; primary quills black above, greyish brown below; under surface of body pure white; wings very long, reaching beyond the tail, which is but very slightly forked. [W. P. P. and T. W.]

2. **Distribution.**—Isolated colonies breed in the Australian and New Zealand seas as well as in the Atlantic. The nearest nesting-places are on the Salvages, the Cape Verde group, and Tristan d'Acunha. In the Australian seas it has been found breeding off Cape Leeuwin, the Houtman's Abrolhos, Chatham Islands, etc. It occurs frequently on the Canaries, has been obtained twice in Great Britain (Walney Island and Colonsay), and also on the coast of Massachusetts. [F. C. R. J.]

MEDITERRANEAN-SHEARWATER [*Puffinus kuhlii* (Boie). French, *puffin cendré*; German, *Kuhls Sturm-Taucher*; Italian, *berta maggiore*].

1. **Description.**—Differs from the great-shearwater in having the side of the head and neck mottled with dusky grey, and by having the flanks and middle of the abdomen white. The sexes are alike in coloration, and there is no seasonal change of plumage. Length about 20 in. [507 mm.]. Top of the head uniform greyish brown, shading into lighter greyish brown, edged with greyish white on the back, wings, and rump; tail dark brown; under surface of body, including the axillaries and under wing-coverts, white; bill, feet, and toes yellow. [W. P. P. and T. W.]

2. **Distribution.**—Breeds in the Mediterranean, and is replaced by an allied form on the Atlantic isles (Canaries, Azores, Salvages, and Madeira), and apparently also by a third on the east coast of North America. In the Mediterranean it is known to breed on the Balearic Isles, Corsica, Sardinia, Sicily, Malta, Lampedusa, the Tunisian coast, Dalmatia, the Ionian Isles, the Cyclades, Lemnos, Crete, etc. The Mediterranean form is mainly resident, but one was picked up on the south coast of England in 1906. The Atlantic form ranges south to the Cape of Good Hope, Kerguelen Island, etc. [F. C. R. J.]

SOOTY-SHEARWATER [*Puffinus griseus* (Gmelin). Black-hagdon].

1. **Description.**—Recognised by its almost uniform brown coloration. Length 17 in.

[431 mm.]. The upper parts, including the wings and tail, are of a dark sooty brown, the under parts lighter; under wing-coverts greyish white; bill horn-colour. [W. P. P. and T. W.]

2. **Distribution.**—Only at present known to breed in the Australian and New Zealand seas, where it has been found nesting on the New Zealand coasts (islands of Kapiti, Karewa, the Rurima rocks, the Kaimanawa range, the hills near Wellington, Whale Island, the S.E. coast of Otago and Stewart's Island), also on the Chatham Islands and the Snares group. Its migrations are extensive, and it ranges in the Pacific to the Chile coast, California, and the Kuriles, while in the Atlantic it is found along the American coasts as far as Labrador and Cape Farewell, and on the east side from the Cape of Good Hope to the coasts of Portugal, France, the British Isles, the Færoes, and probably Iceland. [F. C. R. J.]

LEVANTINE-SHEARWATER [*Puffinus puffinus yellouan* (Acerbi). French, *puffin yellouan*; German, *südlicher Taucher-Sturmvogel*; Italian, *berta minore*].

1. **Description.**—Distinguished from the former species by its smaller size (wing under 10 inches), and by having the axillaries smoky grey. The sexes are alike in coloration, and there is no seasonal plumage. Length about 15 in. [381 mm.]. General colour above, including the wings, dark brownish black; sides of the head, neck, sides, flanks, and under tail-coverts smoky grey; bill dark horn-colour; legs and toes flesh-coloured. [W. P. P. and T. W.]

2. **Distribution.**—This form breeds in the Mediterranean, where it has been recorded as nesting on islets near Corsica, Sardinia, S. France, the Italian coasts, Dalmatia, Malta, the Sporades and Cyclades, Crete, Lemnos, Bosphorus, etc. Twenty-seven are recorded as having been obtained off the coasts of Great Britain, and Buturlin states that it is found on the Black and Caspian Seas, while either this race or the Manx form breeds in the Atlantic isles. [F. C. R. J.]

LITTLE DUSKY-SHEARWATER [*Puffinus obscurus* (Gmelin); *Puffinus assimilis* Gould. Madeiran-shearwater. German, *Afrikanischer kleiner Sturmtaucher*].

1. **Description.**—Distinguished by its small size (wing under 7 inches). Length 11 in. [279 mm.]. Top of the head, neck, back, rump, and upper tail-coverts dark blackish brown; cheeks white, streaked with black; remainder of the under surface, including the under wing-coverts and axillaries, white; iris dark brownish black; bill dull slate-grey; tarsus, inner sides of outer toe, two inner toes and their webs bright lavender; webs livid; back of tarsus, soles, and nails black. [W. P. P. and T. W.]

2. **Distribution.**—The form of this widely distributed species which occurs in the British Isles as a casual is *P. obscurus godmani* Allen, which breeds in the Atlantic isles and the Cape Verde group. In the Cape Verde Archipelago it nests on the Rombos Isles; also on Porto Santo (Madeira), probably on the Azores, and on the Salvages and the Canaries. It is replaced by other allied forms in the western North Atlantic (United States coast and islands of Bahamas and Bermudas), the Mascarene Isles, the Australian and New Zealand seas, the Galapagos Isles, and the Central Pacific. As a casual it has occurred seven times in the British Isles, and also on the Italian coast and in Sardinia. [F. C. R. J.]

SCHLEGEL'S PETREL [*Pterodroma neglecta* (Schlegel)].

1. **Description.**—Differs from *P. hesitata*, the next species, in having the inner webs of the primaries white. The sexes are alike in size and coloration. Length 15½ in. [393 mm.]. General colour of the upper surface dark brown, with the bases of the feathers white and the edges indistinctly marked with lighter brown; under surface of the body white; breast marked with dirty grey; under tail-coverts smoke-brown; primary flight-feathers blackish brown, whitish at the base of the inner web, and with the shafts ivory-white for the greater part of

their length; iris dark brown; bill black; tarsus and basal portions of toes yellow, tips black. [W. P. P. and T. W.]

2. Distribution.—A South Pacific species, whose range is as yet very imperfectly known. It breeds on Raoul and Meyer Islands in the Kermadec group, and has been obtained on Juan Fernandez. It has not been recorded from the Continent, but has been found dead on one occasion in England (Cheshire, 1908). [F. C. R. J.]

CAPPED-PETREL [*Pterodroma hesitata* (Kuhl); *Æstrélata hesitata* (Kuhl). French, *diable diabolin*].

1. Description.—Recognised by its black crown and the white collar round the neck. Length about 14·5 in. [368 mm.]. Mantle brownish grey, shading into deep blackish brown on the lower back, rump, shorter upper tail-coverts, and wings; base of the tail and longer upper tail-coverts, and the whole under surface, white; bend of the wing blackish brown; under wing-coverts white; bill black; legs and base of toes light-coloured; extremity of webs and toes black. [W. P. P. and T. W.]

2. Distribution.—Probably extinct now, but formerly bred in the western Tropical Atlantic. Amongst its recorded breeding-places were the Lesser Antilles, where it formerly nested at the Morne du Diable in the island of Dominica at 2000 feet, and also on Guadeloupe. As a straggler it has occurred in the United States (Florida, Long Island, New York State, Virginia, Vermont, etc.), Canada (Toronto twice), possibly in N. France, and once in England in 1850. [F. C. R. J.]

COLLARED-PETREL [*Pterodroma brevipes* (Peale); *Æstrélata brevipes* (Peale)].

1. Description.—As its name implies, has a blackish grey band, interrupted in front, across the upper chest. Length about 12 in. [305 mm.]. Forehead and lores white; top of the head and below the eye deep brownish black, shading into blackish grey on the mantle; wings deep brownish black; chin, throat, breast, and belly pure white; under wing-coverts and axillaries white; edge of the wing black. [W. P. P. and T. W.]

2. Distribution.—Probably breeds in the Western and Southern Pacific. Macgillivray found it nesting on Aneiteum in the New Hebrides, and specimens were obtained from Tanna and Erromanga, and in the Fiji Isles. The type was secured near the southern ice barrier, in lat. 68° S. It has been once recorded from Japan and once from the Welsh coast (Cardigan, 1889). [F. C. R. J.]

BULWER'S PETREL [*Bulweria bulwerii* (Jardine and Selby). German, *Bulwers Sturmvogel*].

1. Description.—A small sooty brown petrel about 11 in. [279 mm.] long. It may readily be distinguished from all the other species of petrels by the nostrils, which are fleshy at their extremity, with the openings directed forwards and upwards. The plumage is of a nearly uniform sooty brown, paler on the under parts; bill black; tarsi and toes yellow; webs black; the tail is long and cuneate. [W. P. P. and T. W.]

2. Distribution.—Breeds in the islands of the temperate East Atlantic and also in the North Pacific Ocean. In the Atlantic it is known to breed on the Madeiran Desertas, on the Salvage Islands, and on Aleganza and many of the islets in the Canarian group. There is no evidence of nesting on the Azores, where it is said to be a casual visitor. In the Pacific it is found nesting in the Hawaiian group (on Laysan, French Frigate Island, Necker and Bird Islands), in the Bonin and Volcano Isles, south of Japan, where it probably breeds, and on islands off the Fokien coast (*Ibis*, 1905, p. 63). It is said to have occurred casually in Greenland, and five specimens have been obtained in England (Sussex four, Yorks one), while on the west of the Atlantic it is said to occur on the Bermudas. [F. C. R. J.]

[CAPE-PIGEON [*Dáption capénse* (Linnæus)].

1. **Description.**—Has the top of the head, cheeks, sides of the neck, upper neck, mantle, and upper back uniform greyish black; lower back, rump, upper tail-coverts, secondaries and their coverts white, terminating in a broad, rounded marking of greyish black; basal two-thirds of the tail pure white; terminal third greyish black; primary quills margined outwardly and with the tips blackish brown, inner margins and base white; chin and throat white, with a rounded spot of greyish black at the extremity of each feather; remainder of the under surface white; bill and feet black. Length about 16 in. [406 mm.]. [W. P. P. and T. W.]

2. **Distribution.**—This species inhabits the southern seas, and is only a casual wanderer to the North Atlantic. Its normal range extends from the southern tropic to the Antarctic ice barrier, but it has only been found breeding in Kerguelen and the S. Orkneys, though it probably nests also on S. Georgia and the S. Shetlands. It has occurred as a casual on the coasts of Ceylon, Madagascar, the United States, Peru, and three times in the British Isles, but in most cases it is probable that the birds had been captured and afterwards liberated. [F. C. R. J.]

THE ALBATROSSES

[ORDER: *Procellariiformes*. SUBORDER: *Tubinares*. FAMILY: *Procellariidæ*.
SUBFAMILY: *Diomedinæ*]

BLACKBROWED-ALBATROSS [*Diomédea melanóphrys* Temminck. Mollymawk. German, *schwarzzügeliger Albatross*].

1. **Description.**—Distinguished from any other of the British petrels in that the nostrils open on either side of a wide and rounded culmen, and by the black line running through the eye. The sexes are alike in plumage, and no seasonal change takes place. Length about 30 in. [762 mm.]. Head, neck, and under parts white; a black patch in front of and continued in a line behind the eye; back and wings slaty grey, shading into the white neck; rump and upper tail-coverts white; tail coloured like the back and wings; iris hazel; bill yellow, reddish at the tip; legs, feet, and webs fleshy grey; nails yellowish horn. [W. P. P. and T. W.]

2. **Distribution.**—This species is also an inhabitant of the southern oceans, and as a rule does not range much north of the bays of the South African coast and those of South America. It breeds chiefly on the island groups in the New Zealand seas, nesting in large numbers on the Chatham, Auckland, Campbell, Bounty, and Antipodes Islands, and also in the Falklands, Crozets, and Kerguelen. As a casual visitor it has occurred several times in the North Atlantic, once on the Færoes, once in lat. 80° 11' N. and long. 4° E., once in Cambridgeshire (1897); and an albatross, which was probably of this species, was seen twenty miles N.W. of the Orkneys by Harvie-Brown. In America it has been recorded north to California. [F. C. R. J.]

THE GREBES¹

[ORDER: *Colymbiformes*. SUBORDER: *Colymbi*. FAMILY: *Colymbidæ*]

[AMERICAN PIEDBILLED-GREBE, *Podilymbus podicéps* (L.).—Is said to have been killed near Weymouth in 1881; was probably due to an exchange of skins. [F. C. R. J.]]

¹ Vol. iv. p. 405.

THE DIVERS¹[ORDER: *Colymbiformes*. SUBORDER: *Gavia*. FAMILY: *Gaviidae*]**WHITEBILLED-DIVER** [*Gavia adamsii* (Gray); *Colymbus adamsi* Gray. Yellowbilled-diver].

1. **Description.**—Differs from the great northern-diver (*C. glacialis*) (see vol. iv. p. 435) by its much stouter and distinctly upturned beak, which is of a yellowish horn colour, not black as the first-named species. The sexes are alike in coloration, but the female is smaller. Length 32 in. [813 mm.]. The adult in summer plumage has the upper parts deep glossy greenish black; feathers of the upper back and mantle with a square white patch on either web near the extremity; scapulars similarly marked, but the white patches are four times the size; rump spotted with white; head and neck uniform greenish black; throat and fore-neck deep glossy bluish black; on the lower throat and on each side of the neck are patches of white heavily streaked with black; remainder of the under parts and under surface of wings pure white. Adult male and female in non-breeding plumage similar to the great northern-diver (see page 435), but the bill is yellowish horn colour; upper parts brownish black; feathers of the back margined with greyish white; under parts pure white. [w. p. p. and t. w.]

2. **Distribution.**—An Arctic species, which breeds in the Old World east of the Kara Sea and also in Arctic America. It probably nests on Novaya Zemlya, where specimens have been obtained in July and August, and has been recorded from Kolguev, the Kola Peninsula, and the Ob valley. It breeds sparingly on the Taimyr Peninsula, and thence eastward to the Kolyma delta, Chukchi Land, and Kamtschatka, and according to Buturlin its southern breeding limit in E. Siberia is about lat. $67\frac{1}{2}^{\circ}$. In North America it seems to be chiefly confined to the northwest from Liverpool Bay on the east to the mouth of the Yukon on the west, and apparently also on the islands in Bering Sea. At Franklin and Liverpool Bays it is plentiful in the breeding season, and is said to be common also at Great Slave Lake. In winter it has been recorded from the Caspian, Finland, Upper Austria, Italy, once in Sweden, and commonly along the Norwegian coast, while there are about six records from Great Britain (Argyll, Northumberland, Yorks, Norfolk, Suffolk, and Hants). On the Pacific side it has been met with south to Colorado and Japan. [F. C. R. J.]

¹ Vol. iv. p. 435.

STRUCTURAL CHARACTERS AS MEANS OF IDENTIFICATION

[W. P. PYCRAFT]

INTRODUCTORY

WHETHER we are discussing the Class Aves as a whole, or merely such species as are regarded as "British," some definite plan must be adopted. One must either follow the dictionary system, or some scheme of classification. To the former there are many objections; and the choice of the latter is by no means easy, as those who are even superficially acquainted with this subject must know. It becomes necessary, then, to choose between a purely arbitrary system, as into land birds and water birds, and so on, or into birds with hard beaks and soft beaks, and so on, after the fashion of the older systematists, or a system based, as nearly as we can, on natural affinities, on blood-relationship and not superficial likeness—a phylogenetic system, in short.

There can be no doubt but that this is the only true system of classification, even though, at present, opinions differ widely as to the degrees of relationship, thereby leading to more or less strikingly different sequences in the order of different groups, large and small. It was therefore decided to follow, in these volumes, in the main that formulated by Dr. Gadow and employed by Mr. Evans in his most invaluable work on "Birds," published in the *Cambridge Natural History*. For all departures from this arrangement I am myself responsible, the editor having allowed me this privilege. In this, however, I am referring to the major divisions—Orders, Suborders, and Families. In the matter of Genera the case is far otherwise. Here it became impossible for me to impose my own judgment, owing to the breach of continuity it would have occasioned with all other similar works, and the consequent inconvenience to those using these volumes. I have had to adopt genera which no one with even an elementary grasp of the meaning and principles of classification would dream of making.

There are few better illustrations of this lack of appreciation of what should constitute a genus than are to be found in Howard Saunders *Manual of British Birds*. Many of the characters there given are meaningless, and more are utterly inconsequent, as when he sagely remarks in the case of some genera of Ducks that the toes are webbed, or in the case of some of the Alcidæ, when we are told that there are "three toes, all in front, and webbed"! Let any one analyse the formidable array of generic characters he gives as distinctive of *Passer*, *Fringilla*, and *Linota*, and then estimate how many of these are really points of difference, and what is their value.

No attempt is made to furnish diagnostic characters for the Orders, Suborders, Families, and Subfamilies, though such divisions are indicated by headings. He depended mainly, as most ornithologists depend for systematic characters, on colour, and this is a factor which should be ignored, if classification is to be framed on sound, scientific lines. When groups of species display a common type of coloration they should be made sections (a), (b), (c), etc., of one genus based on structural characters.

There seems to be an irresistible desire on the part of amateurs in the task of classification so to arrange the various groups of birds that an apparently easy transition from one to the other is secured. Thus the Passeriformes are linked on to the Coraciiformes by making the former end with the Swallows and the latter begin with the Swifts. The Owls are made to provide the transition to the Accipitres. The Gulls are placed in close proximity to the Petrels, and we are invited to pass from the Auks to the Grebes and Divers, and so on.

This looks simple and natural enough. But when we come to inquire into the reason, or rather the evidence for this arrangement, we find no satisfactory answer forthcoming. As a matter of fact, all such systems are founded on the fallacy that superficial likeness is an indication of affinity. Nothing could be further from the truth. The likenesses which these "links" possess to the members on either side of the chain are purely imaginary. And this can be immediately proved by an appeal to anatomy, an appeal which those who frame such schemes are unable to make.

It is not always so easy to understand the vagaries of the systematists who pursue these methods. What reason, to quote actual and recent examples, can be assigned for placing the goldcrest-wren with the Titmice? Or for placing all the surface-feeding ducks in the genus *Anas* save only the shoveler and the pintail, each of which represents a genus in itself? Or why, again, is the goldeneye included in the genus *Nyroca*, which is made to include all the diving ducks save the Eiders, Scoters, and Mergansers?

The classification adopted in these volumes, I am painfully aware, leaves much to be desired. But it would have been impossible to hold back their publication till the tangled skein which this theme presents had been unravelled. In many cases the information at my disposal has been most unsatisfactory; but the facts I needed were such as demanded more leisure for original investigation than I am likely to possess for a long while to come.

In the matter of plumage-changes, it might be imagined I had every opportunity of study from the vast collections in the British Museum. But this is by no means true. Much, very much, needs yet to be done to fill in gaps in the series possessed by the Museum. These Mr. Ogilvie-Grant, since he assumed the reins of government, is endeavouring to fill up as speedily as possible, but he has much to accomplish before he achieves his end. Male, female, and young, in every season of the year, and from many localities, must be obtained before we are able to give a complete account of the sequences of plumages of a species.

For the sake of the field-naturalist who has to rely on standard works of reference, I had to endeavour to justify as many genera as I could, though it went much against my inclination to do so, and in some cases I have had to abandon the attempt.

The diagnoses of Orders and Suborders and Families are of necessity based on internal structural characters. This must always be so if our classification is to represent pedigree. Blood relationship, descent, must be the key-note of all our endeavours at classification, and this relationship can only be discovered by dissection. In using this unfamiliar material, however, I have drawn as little on anatomy as I possibly could. Muscles I have almost entirely left out of account, such, for example, as the shoulder and thigh muscles and the plantar tendons.

The field-ornithologist is little, if at all, concerned with anatomical details; his work, an essential and all-important side of ornithology, is concerned rather with birds as living things; and commonly also with their external characters after death. But here he touches on the border-line of anatomy. And no field-naturalist who concerns himself with plumage sequences can hope to do really first class work who does not master at any rate the rudiments of pterylosis and feather structure. He should do more. But for this obstinate, wilful neglect, our knowledge of our native birds would be far more thorough than it is. There are some who assure us that the study of British Birds is "played out"—that we have nothing new to learn about them. If the pages of these volumes have shown anything, they have shown that our knowledge of our native avifauna is very far indeed from being complete. But they should

mark a new era in ornithology; for they have brought together all the known facts and have pointed the way for further lines of profitable research.

All systems of classification, based on descent, must have apparent breaks; for we are dealing with different branches of a common stem, and one branch, with its ramifications, must be taken at a time. A linear arrangement from "highest" to "lowest," or *vice versa*, is impossible. The Passerine and Coraciiform birds must, for example, be taken together. They are divergent branches of a common stem, only very remotely related to any other branches of existing birds.

Having disposed of these, one turns next to that great assemblage which includes the Pigeons and Sandgrouse, Gulls, Auks and Plovers; Bustards, Cranes and Rails; and the Gamebirds—these are ramifications of another great branch of the phylogenetic tree. Next come the Accipitres, Storks, Steganopodes and Anseres, and finally the Petrels and Divers. The likenesses which form such pitfalls, between birds like Swifts and Swallows, Owls and Accipitres, Cranes and Storks, for example, are accidental, or rather are due to convergence through adaptation to like needs. As well might one classify Whales and Ichthyosaurs, Newts and Crocodiles, because these present certain features in common. The smooth running of one type into another, which the systematic ornithologist so commonly strives to achieve, can lead only to confusion. He is attempting the impossible, and making confusion worse confounded.

The following "key" is intended for those who are taking up the study of ornithology and are therefore unfamiliar with any save the commonest species of our native birds. Having a specimen which puzzles him, it is assumed that he will turn to this key and endeavour to "run down" his bird: discovering first the order to which it belongs, then passing to the family, thence to the genus. Having found this, the rest is comparatively easy. But even then his difficulties may not be over, for it is by no means easy in some cases to make some specimens agree with written descriptions, owing to the fact that they may present intermediate stages between say the juvenile and adult dress, or the nuptial and winter plumages, which seem difficult to reconcile with any given description. But then it will generally be found that identification is possible by the process of elimination.

GLOSSARY OF TERMS USED IN THE KEY TO THE CLASSIFICATION ADOPTED

I. EXTERNAL CHARACTERS.

*Acrotarsium**—the front part of the tarso-metatarsus.

Apteria—the areas of the body not covered by contour feathers.

Cavernum—the enlarged cavern-like chamber which forms the external aperture of the ear in the Owls.

*Culmen**—the ridge of the beak.

Diastataxic—wings wherein the fifth pair of major secondary coverts do not embrace a remex.

Eutaxic—wings in which each pair of major secondary coverts embraces a remex.

Fossa—a cavity or depression.

*Hallux**—the hind-toe.

Manus—the hand, that portion of the wing skeleton which supports the primaries.*

Nares—the nostrils.

Operculum—applied to the fleshy flap covering the nostrils, e.g. Pheasant, and to the large, semicircular fold of skin covering the external aperture of the ear of the owls of the genus *Asio*.

Pamprodaetylous—all the toes turned forwards.

*Planta**—the sole or hinder border of the tarso-metatarsus.

* Illustrated on p. xiv, vol. i. See List on p. xv.

Podotheca—the scaly covering of the tarso-metatarsus.

*Primaries**—the outermost remiges of the wing, those attached to the manus, which see.

*Rectrices**—the tail feathers.

Remex, pl. *remiges*—flight feather.

Remicle—the vestigial condition of the outermost primary.

Rhamphotheca—the horny beak-sheath.

*Rictal bristles**—the stiff vaneless feather-shafts which guard the gape in nightjars, etc.

*Secondaries**—the remiges of the second series of flight-feathers; those attached to the fore-arm.

Setæ—bristles.

*Tomium**—the cutting edge of the beak.

Zygodactyle—toes two forward, two backward.

II. INTERNAL CHARACTERS.

(a) SKULL.

Egithognathous palate—the Passerine type, wherein the vomer is broad, truncated, and notched in front, and the maxillo-palatines are more or less rod-shaped, with spatulate free ends. (Fig. 3.)

Basipterygoid process—the bony tubercles at the base of the skull, forming supports for the pterygoids. (Fig. 5.)

Bulle—more or less globular, bony chambers.

Carotids—carotid arteries.

Desmognathous palate—wherein the maxillo-palatines meet one another in the middle line, e.g. Ducks, and form a bridge. Vomer may or may not be present. (Fig. 5.)

Fenestrated—pierced, displaying a more or less conspicuous space or "window." (Fig. 9.)

Holorhinal nares—wherein the nasal fossa has a rounded hinder end, not extending beyond the level of the nasal branch of the pre-maxilla. (Fig. 1.)

Inter-orbital septum—the partition between the eyes.

Maxillo-palatine process—the bony spur, or plate, which turns inward from the maxilla to form the roof of the mouth. (Fig. 3.)

Occipital fontanelles—spaces in the bony wall of the back of the skull.

Palatine—the bony rod which runs along the roof of the mouth from the pterygoid to a point near the middle of the upper jaw. (Fig. 4.)

Patella—the knee-cap.

Post-aural—behind the aperture of the ear.

Post-orbital process—the bony spur which descends from the roof of the skull to partly encircle the eyeball. (Fig. 2.)

Pre-aural—before the aperture of the ear.

Pterygoid—the bony rod interposed between the palatine and quadrate. (Fig. 4.)

Quadrate—the quadrangular bone which serves to suspend the lower jaw from the skull. (Fig. 4.)

Saurogathous palate—the arrangement of the palatal bones peculiar to the Woodpeckers, wherein the vomer is greatly reduced and lies wedged in between the palatines, which are fenestrated; and the pterygoid is Y-shaped.

Schizognathous—the form of the palate where the maxillo-palatines are widely sundered. The vomer may or may not be present. (Fig. 4.)

Schizorhinal—where the nasal fossa terminates behind in a slit, which extends backwards beyond the level of the nasal branch of the pre-maxilla. (Fig. 2.)

Supra-orbital groove—the deep trough above the eye in the skulls of Auks, Gulls, Divers, etc. (Fig. 2.)

Symphysis—the point of fusion between two opposing surfaces.

* Illustrated on p. xiv, vol. i. See List on p. xv.

Vomer—the ploughshare bone, the median bony, laterally compressed, or “blade-shaped” plate of bone lying in the roof of the mouth, articulating with the palatines, and often embraced by the palatine processes of the maxilla or “jaw-bone.” In many species the vomer is vestigial, or even wanting altogether. (Fig. 3.)

(b) STERNUM.

Carina-sterni—the body of the breast-bone.

Coracoid—the bony rod attached to the front end of the sternum for the support of the clavicle, or merry-thought.

Meta-sternum—the central portion of the body of the breast-bone.

Spina communis—the perforated median plate formed by the fusion of the spina interna and externa. (Fig. 6.)

Spina externa—the bony spur which arises from the front of the sternum immediately below the coracoid groove. (Fig. 6.)

Spina interna—the bony spur which arises from the body of the sternum, immediately above the coracoid groove and above the spina externa. (Fig. 6.)

Oblique, posterior and lateral processes. See Fig. 6.

(c) LEG and HIP-GIRDLE

Cnemial—appertaining to the knee.

Ectepicondylod process—the bony prominence on the outer side of the lower end of the humerus or upper arm, *e.g.* Gull.

Entepicondylod process—the bony prominence on the inner side of the lower end of the humerus or upper arm bone.

Hypotarsus—the bony spur on the hinder border of the upper end of the tarso-metatarsus.

Pectineal process—the spur in front of the socket for the femur, for the attachment of the ambiens muscle.

Pelvis—the bony girdle for the support of the hind limbs.

(Continued on p. 564)

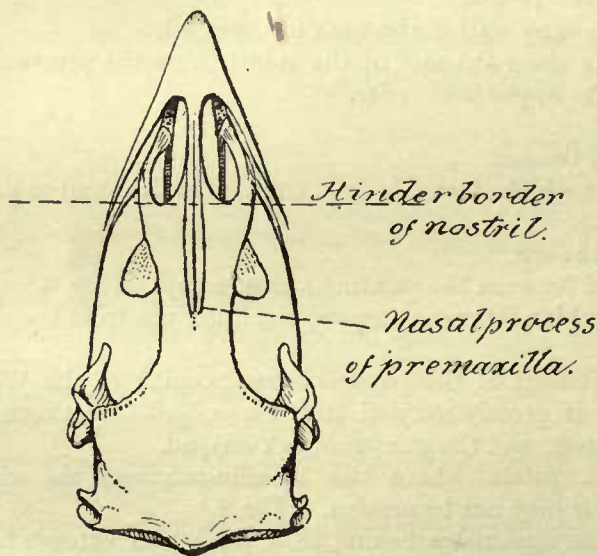


Fig. 1.—HOLORHINAL NARES (PHEASANT).

Top view of the skull of a Pheasant to show the condition of the nostrils known as “holorhinal.” Note that the “nasal processes,” or backward prolongations of the pre-maxilla—which form the chief element in the beak—project far beyond the hinder border of bony aperture of the nostrils.

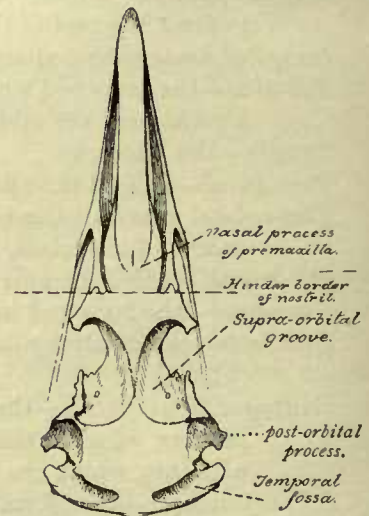


Fig. 2.—SCHIZORHINAL NARES (GULL).

Top view of the skull of a Gull to show the condition of the nostrils known as “schizorhinal.” Note that the nasal processes of the pre-maxilla fall far short of the hinder border of the bony nostrils. The supra-orbital grooves for the lodgment of the supra-orbital glands, which are always largely developed in aquatic birds, and the temporal fossa and post-orbital process are well shown here.

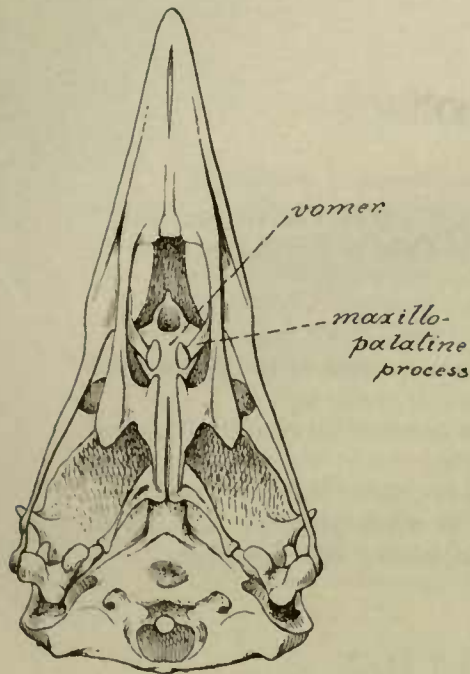


Fig. 3.—ÆGITHOGNATHOUS PALATE (RAVEN).

The skull of a Raven (under side) to show the arrangement of the bones of the palate known as "ægithognathous." Herein the vomer is truncated anteriorly, and the maxillo-palatine processes—outgrowths of the maxilla or upper jaw bone which bears the grinding or cheek teeth in mammals—are strap-shaped.

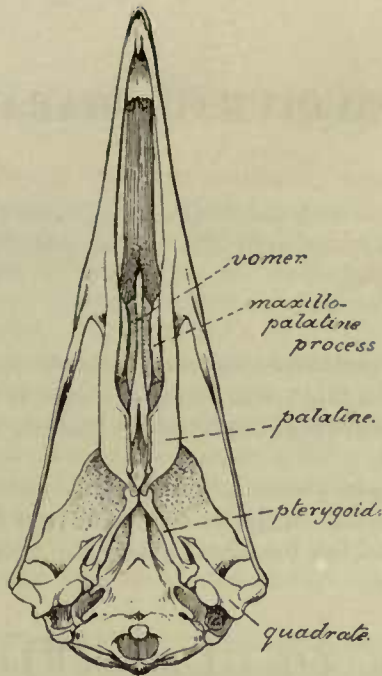


Fig. 4.—SCHIZOGNATHOUS PALATE (GULL, *L. marinus*).

The skull of a Gull to show a "schizognathous" palate. The vomer is large, pointed in front; the maxillo-palatine processes are scroll-shaped.

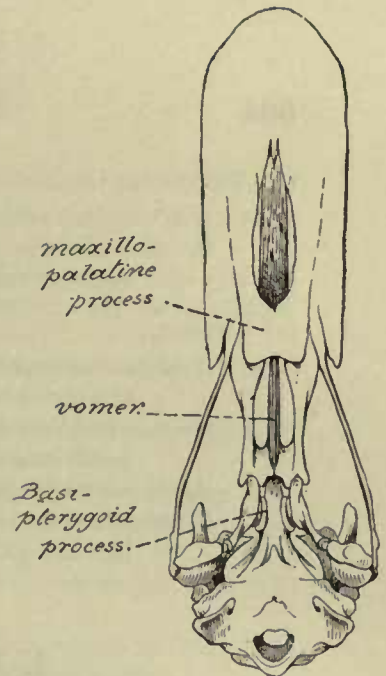


Fig. 5.—DESMOGNATHOUS PALATE (DUCK).

Skull of a Duck to show a "desmognathous" palate. Here the maxillo-palatine processes meet one another in the middle line forming a bridge. The vomer is blade-shaped. Note the basipterygoid processes, which here are sessile. In some cases these processes form short columns.

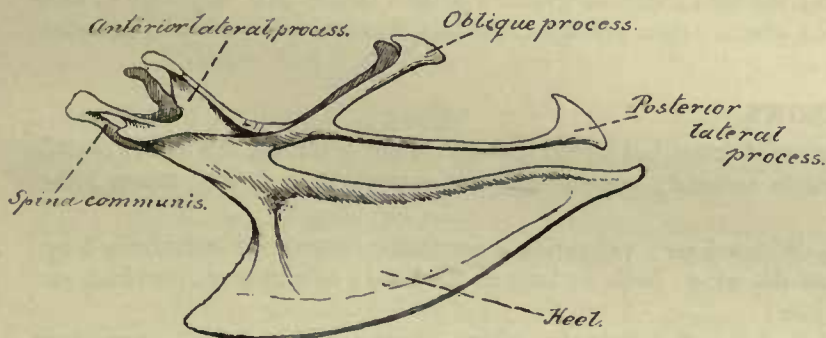


Fig. 6.—STERNUM OR BREAST BONE OF A PHEASANT, SHOWING THE POINTS USED IN CLASSIFICATION.

The oblique and posterior lateral processes are borne on a separate base formed by the deep cleft along the body of the sternum. This type occurs only in the Gallinaceous birds. Note the "spina communis" formed by the fusion of the free ends of the spina interna and externa.

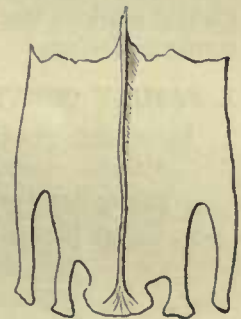


Fig. 8.—BREAST BONE.

Sternum of a Norfolk Plover to show the double-notched condition of the hinder border.

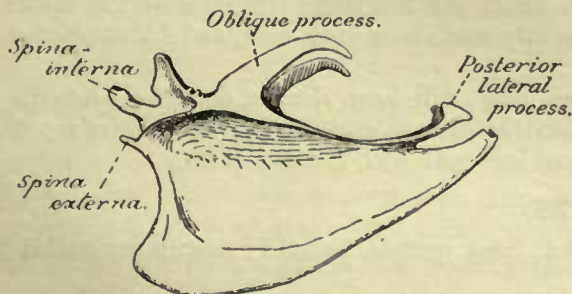


Fig. 7.—BREAST BONE.

Sternum of a Pigeon. Compare the oblique and posterior lateral processes with those of the Pheasant. The spina interna and externa are distinct.

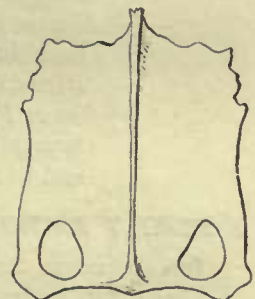


Fig. 9.—BREAST BONE.

Sternum of a Peregrine Falcon to show the "fenestrated" condition of the hinder border, holes or "windows" taking the place of notches.

(d) VERTEBRAL COLUMN.

Heterocœlous vertebra—with saddle-shaped surfaces for articulation one with another.

Opisthocœlous vertebra—wherein the hinder articular surface is cup-shaped, and the anterior spherical.

(e) VISCERA.

Ambiens—a superficial muscle extending from the pectineal process of the pelvis, along the inside of the thigh, and across the knee to the calf of the leg.

Cæca—the blind diverticula of the intestine, marking the junction between the large and small intestine.

Syrinx—the voice organ which in birds is formed at the bottom of the windpipe.

Tracheo-bronchial syrinx—a syrinx formed in part by the windpipe proper, and in part by the right and left branches, or bronchi, communicating with the lungs.

KEY TO CLASSIFICATION

I

ORDER: PASSERIFORMES

All the toes free, hind-toe well developed; aftershaft vestigial; wing eutaxic; oil-gland nude; palate ægithognathous; hinder border of sternum with a single pair of notches; deep plantar tendons free; ambiens absent; cæca vestigial; not less than five pairs of voice muscles; young nidicolous.

1. FAMILY CORVIDÆ—CROWS.

Eleven remiges, the outermost shortest, but longer than the major coverts of the hand; nostrils without operculum, bristle covered; tarso-metatarsus scutellate in front. Sexes alike; young like the adult.

(a) *Genus Corvus*.—Wings long; primaries emarginate, outermost relatively long; tail shorter than the wing; beak as long as the head; colour black, or black and grey. (Vol. i. p. 1.)

(b) *Genus Pica*.—Tail long, fan-shaped; wings short and rounded; outermost primary very short, much attenuated and sabre-shaped. (Vol. i. p. 8.)

(c) *Genus Garrulus*.—Wings short and rounded; bristles covering nostrils very short; major coverts of the hand bright blue, barred with black; crown feathers long and erectile. (Vol. i. p. 8.)

(d) *Genus Nucifraga*.—Wings short and rounded; bristles covering nostrils short; beak long, cylindrical, slightly swollen at the base, and blunt-pointed. (*Rare Birds*, vol. iv. p. 463.)

(e) *Genus Pyrrhocorax*.—Wings long; bill long, slender, decurved; nostrils opening nearer to the tomium than the culmen, concealed by short bristles; claws long and much curved; beak and legs red. (Pl. 7, vol. i. p. 60.)

2. FAMILY FRINGILLIDÆ—FINCHES.

Ten primaries, the outermost vestigial; beak conical, pointed; nostrils concealed by short recurved feathers.

(a) *Genus Liginus*.—Beak sub-cylindrical; three outermost primaries equal. (Vol. i. p. 64.)

- (b) *Genus Coccythraustes*.—Bill massive; a median striated horny pad on roof of mouth, two similar pads on each side of inner surface of lower jaw; inner primaries with billhook-shaped tips. Sexes differ. (Vol. i. p. 65.)
- (c) *Genus Fringilla*.—Beak with the upper jaw markedly swollen at the sides; outermost functional primary markedly shorter than penultimate; wing barred across with white. Sexes differ. (Vol. i. p. 67.)
- (d) *Genus Carduelis*.—Beak slender, conical, pointed; three outer primaries equal; wing barred across with yellow. (Vol. i. p. 69.)
- (e) *Genus Linota*.—Beak conspicuously short; the outermost functional primary longest; tarso-metatarsal scutellæ obsolete. (Vol. i. p. 72.)
- (f) *Genus Passer*.—Beak with both upper and lower jaws laterally inflated, with conspicuous rictal bristles; three outermost primaries equal; tarso-metatarsus conspicuously scutellated. (Vol. i. p. 76.)
- (g) *Genus Loxia*.—Beak with tips of the mandibles crossed; upper jaw grooved. (Vol. i. p. 79.)
- (h) *Genus Pyrrhula*.—Beak very short, much inflated laterally; outermost functional primary shorter than penultimate and antepenultimate. (Vol. i. p. 81.)
- (i) *Genus Emberiza*.—Beak with the cutting edges inturned, a more or less distinct palatal knob; penultimate primary slightly longer than remex on either side; claw of hallux long and arched. (Vol. i. p. 157.)
- (k) *Genus Passerina*.—Beak small, cutting edges inturned, palatal knob inconspicuous; wings long, reaching nearly to end of tail, outermost feather longest; claw of hind-toe long and nearly straight; legs black. (Vol. i. p. 164.)
- (l) *Genus Calcarius*.—Beak with cutting edges inturned; hind claw nearly straight, longer than the toe itself; legs black. (Vol. i. p. 166.)

3. FAMILY ALAUDIDÆ—LARKS.

Hinder border of tarsus more or less distinctly scutellate; nostrils concealed by short brush-like feathers; inner secondaries elongated.

- (a) *Genus Alauda*.—Outermost (10th) primary vestigial; claw of hind-toe very long and straight; tarso-metatarsus slightly longer than middle toe and claw. (Vol. i. p. 199.)
- (b) *Genus Eremophila*.—Outermost (10th) primary vestigial; claw of hind-toe long and straight; tarso-metatarsus not exceeding the middle toe and claw. (Vol. i. p. 203.)
- (c) *Genus Melanocorypha*.—Beak finch-like, but laterally compressed; 10th primary vestigial; tarso-metatarsus longer than the middle toe and claw; claw of hallux long and straight, longer than the hallux. (*Rare Birds*, vol. iv. p. 474.)
- (d) *Genus Calandrella*.—Beak conical; 10th primary vestigial; inner secondaries long, extending to the end of the primaries; claw of hallux slightly curved, as long as the hallux. (*Rare Birds*, vol. iv. p. 475.)

4. FAMILY MOTACILLIDÆ—WAGTAILS AND PIPITS.

Hinder border of tarso-metatarsus covered with large lateral shields; inner secondaries elongated, reaching to tips of primaries; nostrils covered by a delicate membranous operculum, not bristle covered; 10th primary vestigial.

- (a) *Genus Motacilla*.—Tail as long as, or longer than, the wing from wrist to tip. (Vol. i. p. 221.)
- (b) *Genus Anthus*.—Tail shorter than, or not exceeding, the wing. (Vol. i. p. 229.)

5. FAMILY CETHIIDÆ—TREE-CREEPERS.

Beak long, slender, decurved; nostrils covered by a membranous operculum; outermost (10th) primary extending considerably beyond the level of the primary major coverts; wing short, rounded, 8th remex longest; hind-toe and claw very long.

(a) *Genus Certhia*.—Tail long and spiny.

(b) *Genus Tichodroma*.—Tail short, rounded, and of soft feathers. (Vol. i. p. 278.)

6. FAMILY TROGLODYTIDÆ—WRENS.

Beak moderately long, slender, slightly decurved; nostrils covered by a membranous operculum; outermost (10th) primary as long as the tarso-metatarsus; wing short and rounded; outer and middle toes joined at the base.

(a) *Genus Troglodytes*.—Tail short; tarso-metatarsus scutellated in front; claws very long and curved. (Vol. i. p. 286.)

7. FAMILY CINCLIDÆ—DIPPERS.

Beak moderately long and stout, straight, laterally compressed; nostrils in a fossa, covered by a membranous operculum; outermost (10th) primary short, barely extending beyond the primary coverts; outer and middle toes joined at the base; hind-toe longer than inner toe.

(a) *Genus Cinclus*.—Tail short; tarso-metatarsus scutellated in front; claws moderately long and stout; hind-toe shorter than inner toe. (Vol. i. p. 298.)

8. FAMILY TURDIDÆ—THRUSHES.

Scutellæ of acrotarsium fused; outermost (10th) primary vestigial.

(a) *Genus Turdus*.—Beak with a slight notch at the tip; gape with slender rictal bristles; juvenile plumage spotted. (Vol. i. p. 317.)

(b) *Genus Monticola*.¹—Differs from *Turdus* chiefly in its relatively longer wings and shorter tail, and in its conspicuously brighter coloration; tail red. (Vol. iv. p. 482.)

(c) *Genus Saxicola*.—Beak rather wide at the gape; nostrils in a fossa, with a membranous operculum; rictal bristles feeble; culmen longer than the hind-toe; outermost (10th) primary short, not extending to end of primary coverts; tail long, forked. (Vol. i. p. 331.)

(d) *Genus Pratincola*.—Beak short; culmen not longer than the hind-toe; gape wide; rictal bristles long; wings relatively short; tail short. (Vol. i. p. 333.)

(e) *Genus Phœnicurus*.—Beak slender, pointed, slightly emarginate; rictal bristles well developed; acrotarsium covered with a large and three inferior small scutes; tail red. (Vol. i. p. 338.)

(f) *Genus Cyanecula*.—Differs from *Phœnicurus* in having but few rictal bristles, and four inferior scutellæ on the acrotarsium; basal half of tail red; throat blue. (Vol. i. p. 341.)

(g) *Genus Erithacus*.—Beak slender, slightly notched at tip; nostrils in a fossa, covered by a membranous operculum; rictal bristles sparse; outermost (10th) primary relatively long, half as long as 9th. (Vol. i. p. 342.)

(h) *Genus Luscinia*.—Beak slender, slightly notched at tip; rictal bristles vestigial; outermost (10th) primary vestigial; acrotarsium covered by a single plate and four inferior scutellæ. (Vol. i. p. 345.)

¹ The recognition of the genus *Monticola* in this place must be regarded as a concession to ornithological usage. In no classification worthy of the name would this genus be recognised.

- (i) *Genus Sylvia*.—Beak short, stout, semi-cylindrical; nostrils in a fossa, covered by a membranous operculum; outermost (10th) primary vestigial, not exceeding, or very slightly exceeding, the major coverts; acrotarsium with numerous scutellæ. (Vol. ii. p. 1.)
- (k) *Genus Regulus*.—Beak slender, straight, slightly notched at the tip; nostril oval, with a membranous operculum concealed by a small plume; acrotarsium covered with a single scale; outer and middle toes united at the base; claws long and curved. (Vol. ii. p. 10.)
- (l) *Genus Hypolais*.—Beak stout, wide at the base; rictal bristles obsolete; outermost (10th) primary vestigial, not extending beyond the level of the primary coverts; tarsus short. (Vol. iv. p. 491.)
- (m) *Genus Agrobates*.—Beak relatively stout; rictal bristles obsolete; 10th primary emarginate, slightly longer than major coverts; tail fan-shaped. (Vol. iv. p. 490.)
- (n) *Genus Phylloscopus*.—Beak short, straight, slender; nostrils in a large fossa, covered with a membranous operculum; feathers of the forehead continued forward above the operculum; rictal bristles obsolete; outermost (10th) primary longer than major coverts; acrotarsium scutellate. (Vol. ii. p. 13.)
- (o) *Genus Herbivocula*.—Beak relatively short and stout; rictal bristles well developed; outermost (10th) primary twice the length of the major coverts. (Vol. iv. p. 491.)
- (p) *Genus Cettia*.—Beak very slender, small and pointed; rictal bristles obsolete; wing very short and rounded; outermost (10th) primary long, half as long as penultimate remex; tail fan-shaped, of ten feathers; under tail-coverts very long, extending to terminal one-third of tail. (Vol. iv. p. 493.)
- (q) *Genus Acrocephalus*.—Beak relatively large, depressed basally; rictal bristles strong; outermost (10th) primary vestigial; tail rounded. (Vol. ii. p. 19.)
- (r) *Genus Locustella*.—Beak very slender; rictal bristles obsolete; outermost (10th) primary vestigial, not reaching to the end of the primary coverts; tail fan-shaped; under tail-coverts very long, extending to the end of the outermost rectrices. (Vol. ii. p. 26.)

9. FAMILY ACCENTORIDÆ—HEDGE-SPARROWS.

Beak thrush-like, but with a slight indentation in front of the nostrils; cutting edges inflected; acrotarsium with numerous distinct scutellæ.

- (a) *Genus Accentor*.—Nostrils in a fossa, covered with a membraneous operculum; rictal bristles obsolete; outermost (10th) primary slightly longer than the major coverts. (Vol. ii. p. 95.)

10. FAMILY STURNIDÆ—STARLINGS.

Beak moderately long, depressed, pointed; nostrils oblong, covered by a membranous operculum which is partly encircled by feathers of the forehead; gape angulated; acrotarsium scutellate; outermost (10th) primary vestigial.

- (a) *Genus Sturnus*.—Feathers of nape, neck, and fore-breast lanceolate; tail short, about half the length of the wing; plumage metallic. (Vol. ii. p. 104.)
- (b) *Genus Pastor*.—Differs from *Sturnus* in having the beak shorter and more arched; adult with a large crest. Coloration of adult pink and black. (Vol. ii. p. 108.)

11. FAMILY ORIOLIDÆ—ORIOLES.

Beak moderately long, conical, and slightly decurved, notched at the tip; rictal bristles

present; acrotarsium scutellate; tarsus short; outermost (10th) primary long. Plumage of adult black and yellow.

(a) *Genus Oriolus*.—Characters included in that of the family, which contains but one genus. (Vol. ii. p. 143.)

12. FAMILY AMPELIDÆ—WAXWINGS.

Beak short, arched, both mandibles notched at the tip, wide at the gape; nostrils round, in a fossa, partly overarched by the feathers of the forehead; 10th primary vestigial; feet short; acrotarsium scutellate.

(a) *Genus Ampelis*.—Secondaries and tail feathers tipped with horny, sealing-wax red expansions to the shaft. (Vol. ii. p. 156.)

13. FAMILY PARIDÆ—TITMICE.

Bill very short and conical; nostrils round without an operculum, concealed by feathers; tarsus scutellate; hind-toe long; claws long and curved.

(a) *Genus Ægithalus*.—Tail very long and fan-shaped. (Vol. ii. p. 171.)

(b) *Genus Parus*.—Tail shorter than the wing; outermost (10th) primary half as long as penultimate remex. (Vol. ii. p. 173.)

14. FAMILY SITTIDÆ—NUTHATCHES.

Beak moderately long, straight; mandible with the inferior border convex; tail short, of soft feathers; acrotarsium scutellate; toes long; claws long and much curved.

(a) *Genus Sitta*.—Nostrils round, without an operculum, bristle covered; outer and middle toe fused at their bases; 10th primary relatively long. (Vol. ii. p. 213.)

15. FAMILY PANURIDÆ—BEARDED-TITMICE.

Beak short, culmen arched; nostrils in a fossa covered by a membranous operculum; outermost (10th) primary in adult vestigial, in juvenile half as long as penultimate; tail very long, fan-shaped.

(a) *Genus Panurus*.—Characters as for the family. (Vol. ii. p. 222.)

16. FAMILY LANIIDÆ—SHRIKES.

Beak stout, laterally compressed, culmen arched; upper jaw with a well-defined "tooth," and hooked at its tip; palatine spurred posteriorly.

(a) *Genus Lanius*.—Nostrils round, without an operculum, and partly concealed by short stiff feathers; acrotarsium scutellate; 10th primary longer than the primary major coverts. (Vol. ii. p. 237.)

17. FAMILY MUSCICAPIDÆ—FLYCATCHERS.

Beak short, depressed, wide at the gape, culmen strongly marked; rictal bristles well developed; nostrils oval, surrounded by membrane and partly concealed by bristles.

(a) *Genus Muscicapa*.—Outermost (10th) primary vestigial, but slightly longer than the major coverts of the hand; scutellæ of acrotarsium fused; middle toe and claw as long as the tarso-metatarsus. (Vol. ii. p. 261.)

18. FAMILY HIRUNDINIDÆ—SWALLOWS.

Spinal feather-tract forked between the scapulæ; beak short, depressed, wide at the gape; outermost (10th) primary vestigial, 9th very long; tarso-metatarsus very short; claws long and curved.

- (a) *Genus Chelidon*.—Tail deeply forked, the outer pair of feathers produced into long streamers. (Vol. ii. p. 277.)
- (b) *Genus Hirundo*.—Tarso-metatarsus feathered to the toes; tail forked. (Vol. ii. p. 282.)
- (c) *Genus Riparia*.—Tarso-metatarsus with a tuft of feathers just above the hallux (Vol. ii. p. 284.)

II

ORDER: CORACIIFORMES

Young nidicolous, nestling down often vestigial or wanting; holorhinal, nares impervious; ambiens wanting; the feet if zygodactyle never associated with a desmognathous palate.

SUBORDER: PICI—WOODPECKERS

Young nidicolous, nestling down vestigial or wanting; feather-tracts very narrow; wing eutaxic; basipterygoid processes wanting; spina interna wanting, spina externa large; hinder border of sternum double notched; feet zygodactylous.

1. FAMILY PICIDÆ.

Tongue protrusible; oil-gland tufted; basipterygoid processes of skull wanting; palate saurognathous; spina interna wanting.

- (a) *Genus Picus*.—Beak long, dense, blunt-pointed, laterally compressed and broad at the base; nostrils oval, covered with bristles; tail feathers pointed and spine-like, outer pair vestigial; 3rd and 4th toes equal; prevailing colour yellowish green and red. (Vol. ii. p. 318.)
- (b) *Genus Dendrocopus*.—Distinguished from *Gecin* in having the 4th toe much longer than the 3rd; prevailing colour black, white, and red. (Vol. ii. p. 320.)
- (c) *Genus Iynx*.—Beak short, sharp-pointed; nostrils linear, partly closed by membrane; outermost (10th) primary minute; tail feathers normal (not spiny), outer pair vestigial; proximal end of planta with a heel-pad; prevailing colour brown and grey. (Vol. ii. p. 342.)

SUBORDER: CYPSELI—SWIFTS

Oil-gland nude; wing eutaxic; hinder border of sternum entire; humerus excessively shortened; manus very long; ten primaries, of which the outermost is the longest; secondaries not exceeding six to seven.

2. FAMILY CYPSELIDÆ.

Beak excessively short, hooked, wide at the gape, which extends below the eye; foot pamprodactylous.

- (a) *Genus Cypselus*.—Tail of ten feathers, deeply forked; tarsus feathered. (Vol. ii. p. 350.)
- (b) *Genus Acanthyllis*.—Tail short and even, the shafts prolonged beyond the vane to form spines; tarsus scutellated. (Vol. iv. p. 501.)

SUBORDER: CAPRIMULGI—NIGHTJARS

Dorsal feather-tract forked; wing diastataxic; tarso-metatarsus very short; toes free, middle toe with pectinated claw; spina externa vestigial, spina interna wanting; cæca large; young down-clad.

3. FAMILY CAPRIMULGIDÆ.

Beak extremely short, wide at the gape, which extends below the eye; rictal bristles very long.

- (a) *Genus Caprimulgus*.—Feet partly syndactyle; tarsus partly feathered; tail long and truncated. (Vol. ii. p. 362.)

SUBORDER: STRIGES—OWLS

Beak raptorial, and with a more or less conspicuous cere; feathers of face forming a disc; hallux reversible; foot of the raptorial type; wing diastataxic; desmognathous palate; cæca large; basipterygoid processes well developed.

4. FAMILY STRIGIDÆ.

The median branch of the ventral feather-tract joining the inner branch posteriorly; the feathers of the acrotarsium directed upwards; oil-gland with two or three filoplumous feathers at its tip; orbit small; interorbital septum extremely thick; palatines fused behind the vomer.

- (a) *Genus Strix*.—External aperture of ear quadrangular, its vertical axis half the horizontal axis of the eyelid; covered with small quadrangular operculum. (Vol. ii. p. 379.)

5. FAMILY ASIONIDÆ.

The median branch of the ventral feather-tract free posteriorly; feathers of the planta directed downwards; no filoplumes on the oil-gland.

- (a) *Genus Asio*.—Height of the vertical axis of the external aperture of the ear three times that of the horizontal axis of the eyelid; operculum of great size, provided with a valve; post-aural fold voluminous; apertures asymmetrical; oil-gland napiform. (Vol. ii. p. 384.)
- (b) *Genus Bubo*.¹—Height of the vertical axis of the external aperture of the ear not exceeding that of the horizontal axis of the eyelid; without an operculum; symmetrical oil-gland conical. (Vol. iv. p. 504.)
- (c) *Genus Scops*.—Posterior division of the cavernum extending its whole vertical height; cere laterally inflated. (Vol. iv. p. 503.)
- (d) *Genus Syrnium*.—Posterior division of the cavernum confined to the lower third; peripheral disc-feathers meeting in the middle line near the symphysis of the mandible; inner branch of the ventral tract arising over the region of the head of the coracoid. (Vol. ii. p. 381.)
- (e) *Genus Ægolius (Nyctala)*.—Interscapular region of the dorsal feather-tract with a short bifurcation; vertical axis of the external ear twice that of the horizontal axis of the eyelid; covered by an operculum. (Vol. iv. p. 502.)
- (f) *Genus Surnia*.—Vertical axis of the ear equal to that of the horizontal axis of the eyelid; no operculum; tail long and pointed; oil-gland napiform. (Vol. iv. p. 503.)
- (g) *Genus Athene*.—Vertical axis of the external ear half that of the horizontal axis of the eyelid; operculum wanting; cere short, much inflated, forming two pisiform swellings on either side of the culmen. (Vol. ii. p. 389.)

SUBORDER: CORACIÆ

With syndactyle foot, a long spina externa and no spina interna, or with the front toes free and a spina communis; an aftershaft; a desmognathous palate and functional cæca.

¹ The genus *Nyctea* (vol. ii. p. 391), save in the matter of colour and the shorter ear-tufts, is indistinguishable from that of *Bubo*.

6. FAMILY CORACIIDÆ—ROLLERS.

Foot anisodactyle; wing eutaxic; cæca long; oil-gland nude.

- (a) *Genus Coracias*.—Beak stout, slightly decurved; gape wide; nostrils partly hidden by setæ; tail of twelve feathers, long and truncated; tarso-metatarsus short, scutellated. (Vol. ii. p. 422.)

7. FAMILY MEROPIDÆ—BEE-EATERS.

Foot syndactyle; wing eutaxic; oil-gland nude; cæca long; sternum with a spina communis

- (a) *Genus Merops*.—Beak long, slender, decurved; nostrils covered by setæ; tail long of twelve feathers, the middle pair produced into streamers. (Vol. iv. p. 504.)

8. FAMILY UPUPIDÆ—HOOPOES.

Foot syndactyle; wing diastataxic; tongue vestigial; a large spina communis; oil-gland tufted; ten tail feathers; cæca wanting.

- (a) *Genus Upupa*.—Beak long, slender, decurved, pointed, and laterally compressed; nostrils concealed by setæ; both acrotarsium and planta scutellated; head with a large erectile double crest; no aftershaft; oil-gland tufted. (Vol. ii. p. 433.)

9. FAMILY ALCEDINIDÆ—KINGFISHERS.

Feather-tracts downy; wing diastataxic; eleven primaries; no aftershaft; oil-gland tufted; a long spina externa, spina interna wanting; foot syndactyle; cæca vestigial; tongue degenerate.

- (a) *Genus Alcedo*.—Beak long, straight, pointed, wide at the gape; nostrils closed by a membrane; tail very short, twelve feathers; blue and red coloration. (Vol. ii. p. 446.)
 (b) *Genus Ceryle*.—Distinguished from *Alcedo* by the long tail and more pointed wings, and the black and white spotted plumage. (Vol. iv. p. 505.)

SUBORDER: CUCULI

Foot zygodactyle; wing eutaxic; desmognathous; basipterygoid processes wanting; oil-gland nude; two carotids; cæca functional; ambiens present.

10. FAMILY CUCULIDÆ—CUCKOOS.

Syrinx tracheo-bronchial; ventral feather-tract single at its base.

- (a) *Genus Cuculus*.—Beak short, slightly decurved; gape wide; nostrils circular, with a membranous rim; wings long and pointed; tail long, fan-shaped, of ten feathers; tarso-metatarsus feathered for nearly half its length. (Vol. ii. p. 458.)
 (b) *Genus Clamator (Coccystes)*.—Differs from *Cuculus* in having the nostrils oval, the wing rounded, and less feathering on the tarsus. (Vol. iv. p. 505.)
 (c) *Genus Coccyzus*.—Not to be distinguished from *Coccystes* save in coloration. (Vol. iv. p. 505.)

III**ORDER: CHARADRIIFORMES**

Palate schizognathous; nostrils schizorhinal; wing diastataxic, with eleven primaries.

SUBORDER: COLUMBÆ

Nestling nidicolous; crop very large, bi-lobed; cæca vestigial; syrinx with asymmetrical extrinsic muscles; basipterygoid processes present; oil-gland nude or wanting; feathers

without aftershaft, and with thickened rhachis; down feathers absent; hallux on a level with the front toes.

1. FAMILY COLUMBIDÆ—PIGEONS.

Ambiens present; vestiges of cæca; oil-gland vestigial; no gall-bladder; twelve rectrices.

- (a) *Genus Columba*.—Tail shorter than the wing, truncated; tarso-metatarsus partly feathered. (Vol. ii. p. 499.)
- (b) *Genus Ectopistes*.—Tail longer than the wing, narrow and pointed, the outer feathers broader than the centre ones. (Vol. iv. p. 506.)
- (c) *Genus Turtur*.—Beak slender, the membranous operculum covering the nostrils forming a tumid swelling; tail much rounded. (Vol. ii. p. 505.)

SUBORDER: PTEROCLES—SANDGROUSE

Nidifugous nestlings; tarso-metatarsus extremely short, feathered; hallux vestigial or wanting; cæca large; vomer vestigial; aftershaft vestigial; tail of sixteen feathers.

2. FAMILY PTEROCLIDÆ.

Characters as for the suborder.

- (a) *Genus Pterocles*.—Hind-toe absent, outer primaries and middle tail feathers produced into filaments. (Vol. ii. p. 525.)

SUBORDER: LARI

Schizognathous, schizorhinal; no basipterygoid processes; vomer well developed; large supra-orbital grooves; pervious nares; feet webbed; oil-gland tufted; eleven primaries, outermost vestigial; wing diastataxic; cæca large; ambiens present; thoracic vertebræ opisthocœlous; eggs pyriform, double spotted.

3. FAMILY ALCIDÆ—AUKS.

Young nidicolous, with abundant nestling down which is never spotted or striped; sternum, pelvis, and ribs all much elongated; femur very short, causing a markedly vertical carriage of the body; tail very short; sternum with a single pair of notches; with an apterion in the spinal tract.

- (a) *Genus Alca*.—Beak laterally compressed and grooved, the tomium of the upper jaw markedly decurved; nostrils lateral, slit-like, near the middle of the inferior border of the jaw, and partly concealed by feathers; tail pointed. (Vol. iii. p. 1.)
- (b) *Genus Uria*.—Beak moderately long, laterally compressed, not dorso-ventrally expanded, and without grooves; nasal aperture partly concealed by feathers; tail short and rounded. (Vol. iii. p. 3.)
- (c) *Genus Cepphus*.—Cannot be distinguished from that of *Uria*. (Vol. iii. p. 7.)
- (d) *Genus Alle*.—Beak short, swollen, without grooves; nostrils ovate, exposed. (Vol. iii. p. 9.)
- (e) *Genus Fraterculus*.—Beak very large, brightly coloured, grooved; height of the beak equal to its length; with horny excrescence on eyelids; legs and toes red; tail short. (Vol. iii. p. 10.)

4. FAMILY LARIDÆ—GULLS.

Young nidifugous, with mottled down, or of a uniform brown colour; hinder border of

sternum double-notched; humerus with a large ectipicondyloid process; cæca vestigial; beak large, with a sharply marked gonys to the lower jaw; nostrils linear, pervious.

- (a) *Genus Sterna*.¹—Beak slender, tapering, moderately long; nostrils pervious; toes semi-palmated; tail forked. (Vol. iii. p. 57.)
- (b) *Genus Xema*.—Tail forked; front toes completely webbed. (Vol. iv. p. 510.)
- (c) *Genus Rhodostethia*.—Tail wedge-shaped; front toes fully webbed; hind-toe with a large curved claw. (Vol. iv. p. 511.)
- (d) *Genus Larus*.—Tail square; front toes fully webbed; hind-toe small but distinct. (Vol. iii. p. 114.)
- (e) *Genus Rissa*.—Tail square, slightly forked in the immature bird; front toes fully webbed; hind-toe vestigial. (Vol. iii. p. 132.)
- (f) *Genus Pagophila*.—Tail square; front toes fully webbed; hallux joined to inner toe by a narrow, serrated membrane; tibia feathered nearly to the tibio-tarsal joint. (Vol. iv. p. 513.)
- (g) *Genus Stercorarius*.²—Beak with a distinct cere; sternum with but a single pair of notches; claws large and hooked. (Vol. iii. p. 197.)

5. FAMILY ŒDICNEMIDÆ—THICK-KNEES.

Holorhinal, schizognathous; nostrils pervious; hallux wanting; tail wedge-shaped; toes webbed at the base; tarso-metatarsus articulated; eye very large.

- (a) *Genus Œdicnemus*.—Beak shorter than the head, swollen at the tip; tail relatively short, not exceeding the length of the head. (Vol. iii. p. 230.)

6. FAMILY GLAREOLIDÆ—PRATINCOLES.

Nostrils impervious; nasal aperture round; skull holorhinal, schizognathous.

- (a) *Genus Glareolas*.—With functional hallux; tarso-metatarsus short, wings very long; tail forked; claw of middle toe pectinated. (Vol. iv. p. 513.)
- (b) *Genus Cursorius*.—Hallux wanting; legs very long; middle toes very long, and with its claw pectinated; tarso-metatarsus scutellate in front. (Vol. iv. p. 514.)

7. FAMILY CHARADRIIDÆ—PLOVERS.

Skull with basipterygoid processes and occipital fontanelles; nestlings nidifugous, striped or mottled.

- (a) *Genus Phalaropus*.—Feet lobed; plantar surface of tarso-metatarsus serrated. (Vol. iii. p. 251.)
- (b) *Genus Scolopax*.—Beak long, cylindrical, somewhat swollen, soft and sensitive at the tip; aperture of the ear seated in advance of the anterior canthus of the eyelid. (Vol. iii. p. 269.)
- (c) *Genus Gallinago*.—Beak as in *Scolopax*, but the aperture of the ear under the eye. (Vol. iii. p. 274.)
- (d) *Genus Charadrius*.³—Beak short, swollen at the tip; wings long and pointed, 11th primary much reduced, 10th the longest in the wing; inner secondaries elongated. (Vol. iii. p. 321.)
- (e) *Genus Vanellus*.—Beak short, swollen at the tip; wings with a carpal tubercle,

¹ The genera *Hydrochelidon*, *Gelochelidon*, and *Anous* are not founded on structural characters and hence cannot be recognised.

² The genus *Stercorarius* must include the so-called genus *Megalestris*.

³ It is impossible without juggling with facts to recognise the genera *Eudromias*, *Ægialites*, *Squatarola*, which must be included in the genus *Charadrius*.

- rounded in contour; 3rd and 4th (= 9th and 8th) primaries longest; head crested. (Vol. iii. p. 325.)
- (f) *Genus Strepsilas*.—Beak short, tapering to a point, nostrils pervious; outermost (10th) primary longest; legs short, front toes connected at the base by a web; lower end of acrotarsium scutellated; planta reticulated. (Vol. iii. p. 389.)
- (g) *Genus Hæmatopus*.—Beak long, laterally compressed, very dense, truncated at the tip; upper jaw with a deep lateral groove; nostrils linear, opening near the base of the beak; podotheca reticulated. (Vol. iii. p. 387.)
- (h) *Genus Recurvirostra*.—Beak very long, recurved, tapering to a delicate point; toes semi-palmated; hallux present. (Vol. iii. p. 413.)
- (i) *Genus Himantopus*.—Beak long, slender, cylindrical, slightly recurved; legs excessively long; middle and outer toes connected by a small web; hind-toe wanting. (Vol. iv. p. 517.)
- (k) *Genus Pelidna*.¹—Beak sub-cylindrical, soft, more or less laterally compressed, and slightly decurved; nostrils linear, pervious at the base of the beak, which is laterally grooved; tarso-metatarsus slender, scutellated; toes free and long. (Vol. iii. p. 421.)
- (l) *Genus Ereunetes*.—Differs from *Pelidna* in having the front toes united at the base by a well-defined web. (Vol. iv. p. 521.)
- (m) *Genus Canutus*.²—(Vol. iii. p. 430.)
- (n) *Genus Calidris*.—Legs short, no hind-toe, front toes not united by a basal web. (Vol. iii. p. 433.)
- (o) *Genus Totanus*.³—Legs relatively long, toes partially webbed, tarso-metatarsus scutellated before and behind. (Vol. iii. p. 438.)
- (p) *Genus Limosa*.—Beak long, slightly recurved; wings long and pointed, projecting beyond the end of the tail; outer and middle toes united by a web. (Vol. iii. p. 450.)
- (q) *Genus Macrorhamphus*.—Beak long, straight, slightly dilated at the tip; wings long; outer and middle toe united by membrane. (Vol. iv. p. 525.)
- (r) *Genus Numenius*.—Beak long, decurved; toes semi-palmated; planta reticulated. (Vol. iii. p. 454.)

IV

ORDER: GRUIFORMES

Schizognathous, holorrhinal; basipterygoids wanting; no spina interna; aftershaft small, diastataxic; cæca functional; young nidifugous; wing diastataxic or eutaxic.

1. FAMILY GRUIDÆ—CRANES.

Oil-gland tufted; aftershaft present; diastataxic; with the heel of the sternum hollowed out to receive the convolutions of the trachea. Hind-toe relatively small, placed above the level of the front toes, which are not webbed at the base.

- (a) *Genus Grus*.—Nostrils in a groove, pervious, near the middle of the beak; crown of head covered with black bristle-like feathers, occiput bar covered with a patch of red carunculated skin; innermost secondaries greatly elongated.

¹ The characters fabricated for the genus *Limicola*, created to receive the broadbilled-sandpiper (*Rare Birds*, vol. iv. p. 518), are so trivial that this species must be included in the genus *Pelidna*, a name which has unwarrantably, in my opinion, ousted that of *Tringa*.

² The characters on which the genus *Canutus* is based are too trivial to be recognised. It must be relegated to that of *Pelidna* = *Tringa*.

³ The genus *Totanus* must be made to include that of *Machetes*, and should properly also include *Limosa* and *Macrorhamphus*, which are divided only by ridiculously trivial characters.

2. FAMILY OTITIDIDÆ—BUSTARDS.

Oil-gland absent; hind-toe absent; sternum double-notched; wing diastataxic.

- (a) *Genus Otis*.—Lateral neck spaces obsolete; nostrils oval, open; tail of twenty feathers; tarso-metatarsus reticulated before and behind. (Vol. iii. p. 541.)

3. FAMILY RALLIDÆ—RAILS.

Oil-gland present, tufted; hind-toe well developed; sternum single-notched posteriorly, very narrow; toes very long; wings rounded; tail feebly developed; wing diastataxic.

- (a) *Genus Crex*.—Culmen shorter than the inner toe; tarso-metatarsus equal in length to the middle toe and claw. (Vol. iii. p. 555.)
- (b) *Genus Porzana*.—Culmen shorter than the head; tarso-metatarsus shorter than middle toe and claw; secondaries very short, falling far short of the tips of the primaries in the closed wing. (Vol. iii. p. 557.)
- (c) *Genus Rallus*.—Beak long, decurved; tarso-metatarsus shorter than middle toe and claw. (Vol. iii. p. 560.)
- (d) *Genus Gallinula*.—Culmen extending backwards on to the forehead to form a large, soft, oval shield; tarso-metatarsus reticulated behind; toes with narrow lateral membranes. (Vol. iii. p. 562.)
- (e) *Genus Fulica*.—Culmen extending backwards on to forehead to form a large, soft, oval shield; toes lobed. (Vol. iii. p. 564.)

V

ORDER: GALLIFORMES

Palate schizognathous; nostrils holorrhinal; basipterygoids present; cæca large; crop large; sternum deeply cleft posteriorly, with a large spina communis; wing eutaxic; aftershaft large; hind-toe well developed; young nidifugous.

1. FAMILY PHASIANIDÆ—PHEASANTS.

Hallux raised above the level of the front toes; vomer degenerate; inner pair of sternal notches extending forwards beyond the level of the base of the keel.

- (a) *Genus Tetrao*.¹—Nostrils feathered; with a narrow supra-orbital wattle; tarso-metatarsus feathered; toes with lateral horny fringes, spurs wanting; eighteen rectrices. (Vol. iv. p. 1.)
- (b) *Genus Lagopus*.—Nostrils feathered; with a narrow supra-orbital wattle; tarso-metatarsus and toes completely feathered, spurs wanting; sixteen rectrices. (Vol. iv. p. 5.)
- (c) *Genus Phasianus*.—Nostrils covered with a leathery operculum; side of head with a large red, papillated, erectile wattle; legs scutellated, armed with spurs; tail fan-shaped. (Vol. iv. p. 37.)
- (d) *Genus Perdix*.—Nostrils covered with a leathery operculum; a small area of bare skin below the eye; legs scutellated, spurs wanting; eighteen rectrices. (Vol. iv. p. 39.)
- (e) *Genus Caccabis*.—Nostrils covered with a leathery operculum; a small area of bare skin round the eye; legs scutellated, the planta armed with conspicuous protuberances; fourteen rectrices. (Vol. iv. p. 42.)
- (f) *Genus Coturnix*.—Nostrils covered with a leathery operculum; face entirely feathered; legs scutellated, spurs wanting; twelve rectrices, hidden by the tail-coverts. (Vol. iv. p. 44.)

¹ The genus *Tetrao* must also be made to include the genus *Lyrurus*.

2. FAMILY TURNICIDÆ—BUSTARD-QUAILS.

Schizognathous palate; schizorhinal nostrils; sternum with a single pair of notches; oil-gland tufted; rectrices concealed by coverts.

(a) *Genus Turnix*.—Wing eutaxic; hallux absent. (*Rare Birds*, vol. iv. p. 530.)

VI

ORDER: ACCIPITRES

Palate desmognathous; nostrils holorhinal; hinder border of sternum fenestrated, or with a single pair of notches; cæca vestigial; oil-gland tufted; wing diastataxic; apteria down-clad; nostrils impervious, opening into a cere; young nidicolous, down-clad.

- (a) *Genus Aquila*.—Beak large, curved from the cere forwards; cutting edge slightly sinuous and ending in a sharp hook; nostrils oval, impervious; tarso-metatarsus feathered to the base of the toes. (Vol. iv. p. 78.)
- (b) *Genus Haliaëtus*.—Beak large and long; nostrils oval; tarso-metatarsus scutellate in front, reticulated behind, shorter than the middle toe. (Vol. iv. p. 80.)
- (c) *Genus Circus*.—Beak small, laterally compressed, cutting edges of upper jaw festooned; feathers of face arranged to form a more or less conspicuous disc; wings long; tail long; legs long and slender. (Vol. iv. p. 94.)
- (d) *Genus Accipiter*.—Beak relatively small, cutting edge festooned; wings short; tail long; legs and toes very long, the latter with long tylari. (Vol. iv. p. 105.)
- (e) *Genus Buteo*.—Beak relatively small; cere large; nostrils oval; cutting edge of upper jaw slightly festooned; tarso-metatarsus short, scutellated; toes short; claws large. (Vol. iv. p. 113.)
- (f) *Genus Milvus*.—Beak relatively small, cutting edge festooned; nostrils slit-like; wings long; tail long and deeply forked; tarso-metatarsus short. (Vol. iv. p. 121.)
- (g) *Genus Elanoides*.—Differs from *Milvus* in having the tail much more deeply forked, and in its black and white coloration. (Vol. iv. p. 535.)
- (h) *Genus Elanus*.—Nostrils slit-like; front of tarso-metatarsus covered with minute roundish scales; tail rounded. (Vol. iv. p. 535.)
- (i) *Genus Pernis*.—Lores densely feathered; feathers of face "scale"-like in appearance; tail rounded, long; tarso-metatarsus with upper portion feathered; lower end reticulated. (Vol. iv. p. 533.)
- (k) *Genus Pandion*.—Beak large; tarso-metatarsus short, reticulated; outer toe reversible; soles of feet covered with horny spikes; aftershaft wanting. (Vol. iv. p. 127.)
- (l) *Genus Falco*.—Nostril circular, with a central tubercle; a strong projecting "tooth" near the tip of the cutting edge of the upper jaw; wings long, pointed, second quill longest; tarsus short, reticulated. (Vol. iv. p. 133.)

VII

ORDER: ANSERIFORMES

Palate desmognathous; nostrils holorhinal; basipterygoids sessile; posterior border of sternum with a single pair of notches; trachea with two pairs of extrinsic muscles; aftershaft small; wing diastataxic; oil-gland tufted; a thick underclothing of down; young nidifugous.

1. FAMILY ANATIDÆ—

Beak having the upper jaw of a more or less inverted trough-shape, with lamellated or ser-

rated edges covered with a thin skin, and terminating in a "nail"; tongue large, fleshy, and laterally bordered with lamellæ; toes webbed.

- (a) *Genus Anser*.—Tarso-metatarsus covered in front as well as at the back and sides with hexagonal reticulations; legs relatively long; lores feathered; serrations on the cutting edge of the upper jaw projecting beyond the tomium, which is sinuated or concave. (Vol. iv. p. 151.)
- (b) *Genus Branta*.—Differs from *Anser* only in that the serrations of the upper jaw are concealed save only at the gape; tomium straight. (Vol. iv. p. 157.)
- (c) *Genus Cygnus*.—Lores naked; front of the tarso-metatarsus reticulated; neck very long; legs short; hallux without a lobe. (Vol. iv. p. 171.)
- (d) *Genus Tadorna*.—Beak conspicuously recurved; hind-toe without a lobe; tarso-metatarsus nearly as long as the middle toe and claw; wrist of the wing with a more or less conspicuous knob or incipient spur, but covered with feathers; syrinx with a double bulb; coloration conspicuous; sexes alike. (Vol. iv. pp. 189, 540.)
- (e) *Genus Anas*.—Beak as long as the head, more or less depressed dorso-ventrally; lamellæ along the edges of both upper and under jaws well marked; tail of eighteen feathers, of which the four central in the male are recurved. (Vol. iv. pp. 191, 540.)
- (f) *Genus Spatula*.—Beak much longer than the head, conspicuously laterally expanded at the tip; lamellæ very long; legs very short; tail of fourteen feathers. (Vol. iv. p. 196.)
- (g) *Genus Dafila*.—Beak as long as the head; lamellæ not conspicuously developed; inner secondaries and scapulars elongated and acuminate; tail of sixteen feathers, long and pointed; neck very long and slender. (Vol. iv. p. 199.)
- (h) *Genus Nettion*.¹—Beak narrow; lamellæ not projecting beyond the cutting edges, nearly as long as the head; inner secondaries and scapulars elongated; tail of sixteen feathers, short and rounded. (Vol. iv. pp. 202, 540.)
- (i) *Genus Mareca*.—Beak conspicuously shorter than the head, tapering towards the tip; lamellæ of upper jaw projecting beyond the cutting edges; tail of sixteen feathers, short and pointed; hallux with a small lobe. (Vol. iv. pp. 207, 541.)
- (k) *Genus Nettion*.—Beak long, conspicuously recurved, not expanded at the tip; loreal feathering with a straight or slightly concave anterior outline; nail more than one-third as wide as the transverse diameter of the middle of the beak; hallux with a large lobe. (Vol. iv. pp. 202, 540.)
- (l) *Genus Fuligula*.—Beak relatively short, more or less markedly expanded towards the tip; loreal feathering with a conspicuously convex anterior outline; nail less than one-third as wide as the transverse diameter of the middle of the beak. (Vol. iv. pp. 241, 542.)
- (m) *Genus Clangula*.—Beak much shorter than the head; lamellæ concealed by the overhanging edge of the upper jaw; nostrils nearer the tip of the beak than to the base; tail of sixteen feathers; hallux with a large lobe. (Vol. iv. pp. 250, 543.)
- (n) *Genus Harelda*.—Beak shorter than the head, tapering towards the tip, and with the tomium of the upper jaw rising towards the nail in a conspicuously sudden curve; lamellæ projecting beyond the tomium along the proximal half of the upper jaw; nostrils near the base of the beak; scapulars much elongated and lanceolate in the male; tail of fourteen feathers, the central pair much elongated in the male; hallux small, with a large lobe. (Vol. iv. p. 253.)
- (o) *Genus Histrionica (Cosmonetta)*.—Beak short, tapering towards the tip; lamellæ concealed; tomium nearly straight; nostrils nearer the base of the beak than its

¹ The genus *Querquedula* must be merged in that of *Nettion*.

middle; feathering of forehead extending forward to a point between the nostrils; tail of fourteen feathers. (Vol. iv. p. 544.)

- (p) *Genus Somateria*.—Beak long; feathers of the forehead extending forwards on to the culmen to form an *m*-shaped extension, in which the median lobe may be of great length; tail of fourteen feathers. (Vol. iv. pp. 256, 544.)
- (q) *Genus Oidemia*.—Beak more or less swollen at the base; nostrils in the middle of a line drawn from the tip to the gape; lamellæ large and widely spaced, outer as long as the middle toe and much longer than the tarso-metatarsus; hallux with a large lobe; syrinx without bullæ. (Vol. iv. pp. 259, 545.)
- (r) *Genus Mergus*.—Beak subcylindrical, with strong serrations along the tomium or cutting edge of the lower jaw; hind-toe with a large lobe. (Vol. iv. pp. 286, 546.)

VIII

ORDER: CICONIIFORMES

Palate desmognathous; basipterygoid processes wanting; spina interna wanting; cæca vestigial; single pair of tracheal muscles; oil-gland tufted; wing diastataxic; young nidicolous.

SUBORDER: ARDEÆ

Beak long and pointed; hypotarsus complicated, with long cervical apteria; claw of middle toe pectinated; nostrils holorrhinal; hinder border of sternum with a single pair of notches; hallux on the same plane as the front toes.

1. FAMILY ARDEIDÆ—HERONS.

With large powder-down patches; eleven primaries; nineteen to twenty cervical vertebræ.

- (a) *Genus Ardea*.—Twelve rectrices; tarso-metatarsus longer than the middle toe and claw; claw of hallux curved, not half as long as the hallux itself; edges of beak serrated. (Vol. iv. pp. 326, 547.)
- (b) *Genus Phoyx*.—Tarso-metatarsus less than the length of the middle toe and claw; twelve rectrices; claw of hallux long, nearly straight.
- (c) *Genus Herodias*.—Edges of beak not serrated; culmen not exceeding the length of the middle toe and claw, with a long dorsal train of plumes.
- (d) *Genus Garzetta*.—Culmen exceeding the length of the middle toe and claw; tarso-metatarsus longer than the beak, with a long dorsal train of plumes. (Vol. iv. p. 548.)
- (e) *Genus Nycticorax*.—Beak laterally compressed, equal to the tarso-metatarsus in length; tail short, of twelve feathers; tarso-metatarsus longer than the middle toe, with hexagonal scutellæ in front. (Vol. iv. p. 549.)
- (f) *Genus Ardeola*.—Beak long, serrated near the tip; equal in length to the middle toe and claw; tail of twelve feathers; with well-developed dorsal plumes and a pendent nuchal crest. (Vol. iv. p. 548.)
- (g) *Genus Ixobrychus*.—Beak serrated, slender, longer than the head; tail of ten feathers; tarso-metatarsus anteriorly scutellated, as long as the middle toe and claw; back of neck down-covered; lateral neck feathers much elongated.
- (h) *Genus Botaurus*.—Beak longer than the head, serrated; tail of ten feathers; middle toe and claw much longer than the tarso-metatarsus; claw of hallux very long, nearly as long as the hallux; lateral neck feathers much elongated; back of the neck down-clad only. (Vol. iv. pp. 330, 550.)

SUBORDER: CICONIÆ

Beak long; hypotarsus simple; without cervical apteria; claw of middle toe not pectinated; hallux raised above the level of the front toes; no powder-down patches.

2. FAMILY CICONIIDÆ—STORKS.

Beak long, straight and pointed; tongue vestigial; temporal fossæ deep; sternum with a single pair of notches; toes webbed at the base.

(a) *Genus Ciconia*.—Beak longer than the head, straight and pointed. (Vol. iv. p. 551.)

3. FAMILY IBIDÆ—IBISES.

Beak-sheath compound; beak not pointed; temporal fossæ shallow; with large occipital fontanelles; sternum with two notches on its hinder border.

(a) *Genus Egatheus*.—Beak subcylindrical, decurved; nostrils schizorhinal; tarso-metatarsus scutellate; face naked. (Vol. iv. p. 317.)

(b) *Genus Platalea*.—Beak depressed dorso-ventrally, and spoon-shaped; nostrils holorhinal; tarso-metatarsus reticulated; face naked. (Vol. iv. p. 306.)

SUBORDER: PHENICOPTERI

Holorhinal; spina interna Y-shaped; twelve primaries; tongue large and fleshy; rhamphotheca soft; supra-orbital grooves well developed; cæca large; wing diastataxic.

4. FAMILY PHENICOPTERIDÆ—FLAMINGOES.

Beak sharply deflected in the middle; lower jaw larger than the upper; edges of beak lamellated; toes webbed.

(a) *Genus Phænicopterus*.—Edges of upper jaw overlapping the lower jaw; throat naked. (Vol. iv. p. 546.)

SUBORDER: STEGANOPODES

All four toes included within a common web; cæca vestigial; apteria very small; tongue vestigial; nostrils obsolete; rhamphotheca compound; carina sterni produced far forward beyond the body of the sternum.

5. FAMILY PHALACROCORACIDÆ—CORMORANTS.

With a single pair of syringeal muscles; opisthocœlous thoracic vertebræ; a small spina sterni externa; beak hooked, hinged at its base.

(a) *Genus Phalacrocorax*.—Face and throat naked; tail rounded, of twelve or fourteen long, stiff feathers; outer toe longer than the middle toe. (Vol. iv. p. 352.)

6. FAMILY SULIDÆ—GANNETS.

Syringeal muscles wanting; thoracic vertebræ opisthocœlous; spina externa and interna wanting; beak cone-shaped, pointed with a hinge at its base.

(a) *Genus Sula*.—Beak with serrated edges; face and throat naked; tail pointed; middle toe longer than the outer toe. (Vol. iv. p. 364.)

IX

ORDER: PROCELLARIIFORMES

Palate schizognathous; nostrils holorhinal; a large laterally expanded vomer fused at its base with the palatines; deep supra-orbital depressions; beak hooked; rhamphotheca compound; nostrils tubular; oil-gland tufted; wing diastataxic; front toes webbed; hind-toe vestigial or wanting; young nidicolous.

1. FAMILY PROCELLARIIDÆ—PETRELS.

Supra-orbital grooves without an external overhanging ledge; temporal fossæ when present in the form of deep depressions approaching one another in the middle line; nasal fossæ large, divided by a median septum; length of upper jaw never much exceeding that of the cranium; basipterygoid processes more or less well developed; palatines long, sharply defined anteriorly at their junction with the maxillo-palatine processes, which are small and plate-like lamellæ never projecting downwards beyond the level of the tomium.

- (a) *Genus Hydrobates*.—Supra-orbital grooves very narrow, separated by a very broad interorbital ridge; basipterygoid processes vestigial, lachrymal fused; tarso-metatarsus longer than the middle toe and claw; tail not forked. (Vol. iv. p. 380.)
- (b) *Genus Oceanodroma*.—Tail forked; tarsus not exceeding the length of the middle toe and claw. (Vol. iv. pp. 382, 552.)
- (c) *Genus Oceanites*.—Claws flat; wing-bones shorter than leg-bones; keel of the sternum with a large fenestra; tarso-metatarsus covered in front with a large shield; only ten secondaries; tail very slightly forked. (Vol. iv. p. 553.)
- (d) *Genus Pelagodroma*.¹—Differs from *Oceanites* chiefly in the more flattened form of the claws; and in the skeleton in having a conspicuous pair of "wings" behind the supra-orbital grooves; and the great width of the base of the coracoid, which nearly equals the length of the shaft. (Vol. iv. p. 553.)
- (e) *Genus Æstrelata*.—Nostrils with the tubular apertures united above the culmen; beak shorter than the head; tarso-metatarsus reticulated; posterior border of sternum with four notches; interorbital region of frontals much greater than the width of the supra-orbital grooves. (Vol. iv. p. 555.)
- (f) *Genus Bulweria*.—Tubular aperture of nostrils opening on the culmen, fleshy at the rim, with a median septum; tail long and cuneate. (Vol. iv. p. 555.)
- (g) *Genus Puffinus*.—Nostrils opening on each side of the culmen; tarso-metatarsus laterally compressed; posterior border of sternum with four deep notches. (Vol. iv. pp. 383, 553.)
- (h) *Genus Fulmarus*.—Tubular aperture of nostrils single, opening above the culmen nasal septum within the tube; outer pair of sternal notches obliterated; tail feathers fourteen; temporal fossa deep, nearly meeting in the mid-dorsal line. (Vol. iv. p. 387.)
- (i) *Genus Daption*.—Tubular aperture of nostrils single, opening on the culmen; inter-ramal space bare; beak flattened, wider than high at the base; temporal fossa shallow; outer pair of sternal notches obsolete; tail feathers fourteen. (Vol. iv. p. 556.)

¹ The genus *Pelagodroma* should be merged with that of *Oceanites*.

2. FAMILY DIOMEDEIDÆ—ALBATROSES.

Supra-orbital groove, with a more or less extensive overhanging ledge, the free edge of which is flattened; temporal fossæ represented by shallow semicircular depressions of uniform depth, divided one from another by the broad, shield-shaped roof of the skull; nasal fossæ almost completely closed; external apertures of nostrils in the form of small tubes lying in a groove on each side of the beak; length of upper jaw greatly exceeding that of the cranium; palatines closely approximated in the middle line, so as nearly to conceal the vomer; palatines relatively short, and with ventral keels reaching down to the level of the tomium; wing very long and ribbon-shaped.

- (a) *Genus Diomedea*.—Interorbital region of frontals very broad; culmen concave; feathering at the base of the upper jaw extending forwards nearly to the base of the nasal tube; feathering of the lower jaw extending forwards nearly as far as the level of the aperture of the nostril. (Vol. iv. p. 556.)

X

ORDER: COLYMBIFORMES

Skull schizognathous; nostrils holorhinal; basipterygoid processes absent; temporal fossæ deep; spina externa short, bifid; spina interna wanting; pelvis laterally compressed; neck pterylosis without apteria; wing diastataxic; young nidifugous.

1. FAMILY COLYMBIDÆ (PODICIPEDIDÆ)—GREBES.

Supra-orbital grooves feebly developed, lachrymal free; post-orbital processes obsolete; greatest width of sternum more than half, sometimes equal to, its length; metasternum deeply notched; cnemial crest shorter than femur; patella very large; tarso-metatarsus laterally compressed; front toes lobed; tail vestigial.

- (a) *Genus Colymbus (Podicipes)*.—Characters as for the family. (Vol. iv. p. 405.)

2. FAMILY GAVIAE (COLYMBIDÆ)—DIVERS.

Supra-orbital grooves very deep and with a well-developed ledge; temporal fossæ wide, and separated by a median sagittal ridge; lachrymal fused with nasal; large post-orbital processes; cnemial process of tibio-tarsus rising high above the articular surface, longer than the femur; greatest width of sternum less half its length; metasternum linguiform; tarso-metatarsus laterally compressed; front toes webbed; tail well developed but short.

- (a) *Genus Gavia (Colymbus)*.—Characters as for the family. (Vol. iv. p. 435.)

BRITISH GENERAL MIGRATORY MOVEMENTS

[T. A. COWARD]

I. INTRODUCTION

SOME 190 species or subspecies of birds nest with regularity in the British Islands, but out of the 470 or even more birds which have some claim to insertion in our avian catalogue, no fewer than 116 are regular winter visitors or birds of passage.¹ This, so large a proportion of the Palearctic avifauna, justifies the contention that the British Islands are specially attractive to migrants. The natural conclusion is that many birds select a coastwise in preference to a purely overland route, that is, they prefer to travel along the western seaboard of Scandinavia, and the western shores of Europe generally, rather than traverse the Continent overland due north and south. Scotland and its islands, and the east and south of England, are convenient resting-places for travellers to or from Western Scandinavia; South-eastern England is little removed from the path of the great stream of birds which, journeying from Siberia, Northern Russia, and Germany, makes use of the Baltic coasts, crosses the narrow neck of land to the south of Denmark, passes near or over the world-famed ornithological "observatory" of Heligoland, and, augmented by inland birds from northern Central Europe, coasts southward along the south-western borders of the North Sea.² The bulk of these northern birds are travelling in autumn southward along the Atlantic shores of France towards the Iberian Peninsula and North Africa; the route of some may be deflected eastward into the Mediterranean basin.

II. STUDY OF MIGRATION

The general lines upon which the study of migration has been followed are, briefly, as below:—

1. The recording of the first and, to a lesser degree, last dates upon which any particular

¹ In making this rough calculation no bird is counted twice; the swallow, for instance, is considered as a breeding species, as the passage form is not recognised as subspecifically distinct. Saunders, in the second edition of his *Manual* (1899), gives the number of birds which had nested within the British Islands during the nineteenth century as 199. The evidence on which some were included is slender, and some were even then extinct as nesting species. Others, like the ruff and bittern, have been reinstated, and some, such as the blueheaded-wagtail, willow-titmouse, and blacknecked-grebe, have been added, whilst the insular races of birds, like the Irish jay and coal-titmouse and the Shetland-wren, had not been recognised. Saunders treated 140 as more or less infrequent, and 45 as regular non-breeding visitors. Opinions differ as to how many of the remaining 280 species on our present list should be considered to be regular or irregular visitors, and some ornithologists maintain that certain of them should not be included as British under any class.

² The assertion that there was a direct east to west and west to east fly-line between Heligoland and the shores of Lincolnshire, founded on almost simultaneous observations of the grey-crow and other species by Gätke and John Cordeaux, was refuted by Mr. Eagle Clarke. Occasionally birds which have passed Heligoland may be drifted westward so far as the southern English shores, but the direction of the main stream is normally south-west.

bird is noticed in a given area. When these observations are repeated for a number of years by many observers scattered over a considerable tract of country, they are useful. This is one of the systems adopted by the committee of the British Ornithologists' Club, which for many years has been accumulating valuable information about migration in England.

2. The recording of observations made at the lighthouses and lightships round the coast verified whenever possible by the wings of birds which have struck the lights. This work was begun by the British Association Committee in 1883 and carried on for many years, and has since been adopted by the B.O.C. Migration Committee. It has one drawback; the best observations are those which are made during weather which is unfavourable to normal migration; at such times the birds are lured to the lights.

3. The systematic observation, aided by collecting, of the visitors to any restricted area, such as an outlying island which is a convenient resting-place for passage birds. The work of Mr. Eagle Clarke and his helpers at Fair Island, St. Kilda, and the Flannans, and of the Misses Rintoul and Baxter at the Isle of May, are sufficient proof of the efficacy of this method. It has not only increased our knowledge, but has shown that many regular and irregular movements take place about which, in former years, absolutely nothing was known.

4. The collecting of records of rare birds killed by sportsmen, collectors, and others. The destruction of these birds has been deplored, but it is foolish to refuse to add to knowledge by disregarding the records. These records are to be found in most carefully prepared local faunas, and have been ably summarised in the recently issued *Hand-List*.¹

5. The marking of passage birds by means of numbered rings, and the tabulation of the details of recoveries. This last system, practised on the Continent before it was adopted by English and Scottish naturalists, though sometimes belittled as too slow and laborious a method of obtaining information, is becoming one of the most important of the systems, for it is demonstrating that many of the accepted theories are futile, and is providing indisputable facts which will, when more are collected, supply data upon which sound theories can be based.

III. CLASSIFICATION OF MOVEMENTS

The movements may be classified according to season, breeding area, or the region beyond our islands from which the birds travel. Whichever classification is adopted, there are a number of species which cannot be described under a single heading, and some are represented in several classes. This is well exemplified by such species as the rook, skylark, starling, and swallow (vol. i. pp. 5, 200; vol. ii. pp. 105, 278).

It may be accepted as an axiom that in the northern hemisphere migration is as a rule from colder to warmer zones in autumn, and in the reverse direction in spring; the avian movements are more or less synchronal with those of the isotherms. Thus the general trend is from north to south in autumn, south to north in spring. There are, however, certain clearly defined east to west autumnal, and west to east vernal movements, which are especially noticeable in the south-east of England. The birds come to winter in the warmer though not necessarily more southern part of their range.

The seasonal movements are as follows:—

¹ *A Hand-List of British Birds*, Hartert, Jourdain, Ticehurst, and Witherby, 1912.

Spring and Summer.

(a) Immigration of species which nest in the British Islands, travelling from Southern Europe and Africa *via* the Iberian Peninsula and France, or from the south-east.



GENERAL SPRING MIGRATION.

A.E.F.G. Summer Visitors and Birds of Passage from Africa and Southern Europe.

B.E. Winter Visitors and Birds of Passage to Northern Europe.

C.F. Winter Visitors and Birds of Passage to Central Europe.

D.G. Winter Visitors and Birds of Passage to Greenland, Iceland, and the North-west.

The arrows do not indicate routes, but only the general direction of the immigrants and emigrants.

(b) Emigration of species which have spent the winter in the British Islands, and are departing to North Europe and Siberia to breed.

(c) Emigration of winter visitors towards Central and Eastern Europe.

(d) Emigration of winter visitors towards Iceland, Greenland, and the Arctic to the north or north-west.

(e, f, g) Immigration and emigration of birds of passage, passing along our coasts or crossing the country on their way from winter quarters to the south of Britain towards the same destinations as b, c, and d.

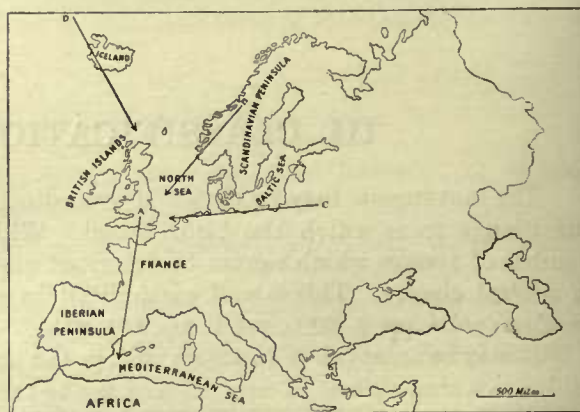
(h) Internal movements within our islands, and intermigration between Great Britain and Ireland. The movements of birds which both winter and nest within the British area.

(i) Irregular movements.

Autumn and Winter.

Practically the reversal of all movements to h, with an increase in irregular movements, especially between Great Britain and Ireland, due to the influence of greater climatic variations during the colder months.

Irruptions or the excessive migration of certain species, due to influences at work over a large extra-British area, may occur at any season, but are perhaps most frequent in spring and summer. The spring immigration of the summer visitors is more noticeable than the autumn departure of the same species. The field-naturalist is always ready to welcome the first swallow, to listen again to the sweet voice of the willow-wren, and often far too eager to hear the incoming cuckoo. The autumn departure takes place when many of the birds are silent, and although the numbers which leave are larger than those which arrived, due to the presence of the season's young, the birds slip quietly away—they may be far on their journey before they are missed. Indeed, at all seasons immigration is more



GENERAL AUTUMN MIGRATION.

A. Emigration of Summer Visitors and Birds of Passage to Southern Europe and Africa.

B. Immigration of Winter Visitors and Birds of Passage from Northern Europe.

C. Immigration of Winter Visitors and Birds of Passage from Central and Eastern Europe.

D. Immigration of Winter Visitors and Birds of Passage from Iceland, Greenland, and the North-west.

The arrows do not represent actual routes, but only indicate the general direction of flight.

noticeable than emigration; we have not seen

our visitors for so long. The sportsman in autumn looks in favoured spots for the first woodcock ; he welcomes it—with a cartridge.

IV. CLASSIFICATION OF BRITISH BIRDS ACCORDING TO THEIR SEASONAL MOVEMENTS

In the previous pages the known migratory movements of each species are described in detail ; it is only necessary to summarise and review the general aspect of migration as affecting the British area. For this purpose the following grouping will suffice:—

1. **Resident Species.**—Birds which are present as *species* within the British area throughout the year. Some of these are *stationary*, that is, the individuals which compose them do not move outside the British area ; they perform only local movements, which take them from the nesting ground to some other locality within the British area : *e.g.* the red-grouse. Other species are both stationary and migratory ; the species is always present, but may be represented to a greater or less extent at various seasons by different individuals, owing to emigration and immigration. A resident *species* may comprise, therefore, *individuals* that are stationary, summer visitors, winter visitors, and birds of passage : *e.g.* the starling.

2. **Summer Visitors.**—Species which arrive in the British Islands in the spring to breed, and normally depart again south in autumn : example, nightingale. Some of these species include *birds of passage* which do not remain to breed, but visit us in spring and autumn on their way to and from more northerly breeding areas : *e.g.* swallow.

3. **Winter Visitors.**—Species which arrive in the British Isles in autumn and remain until the spring, when they depart to northern or eastern breeding quarters. Some of these also are represented by *birds of passage* which visit us only for a short period on their way to and from more southerly winter quarters : example, fieldfare.

4. **Birds of Passage.**—This term applies to *individuals* that pass our shores on their way to their destination elsewhere. Many belong to species that are summer visitors, winter visitors, or residents, but a number, which may be called *passage species*, are not represented by any individuals which remain on our shores, except to rest and pass on : *e.g.* bluethroat.

5. **Irregular Visitors.**—Species which are in the habit of visiting the British Isles, sometimes in great numbers, at irregular but recurring intervals : example, sandgrouse.

6. **Accidental Visitors.**—Birds which do not normally travel along the British migration routes, but have, for one reason or another, strayed accidentally into our area : example, American bittern.

V. RESIDENT SPECIES

There are probably few, if any, of the stationary species which do not perform some local movements. The red-grouse will at times leave the upper moors for lower ground, urged either by the presence of food or driven from the uplands by severe weather and the consequent absence of food. It may migrate to better feeding-ground in search of berries or young heather, and these movements may become seasonal and regular. The meadow-pipit and twite, which share the moorlands with the grouse, may journey no farther than the valleys in winter, or they may travel for many miles to the coast. Many of the tits, often accompanied by one or two creepers, regularly form flocks in winter, and wander in nomadic bands from food-base to food-base.

Several of our stationary forms differ more or less markedly from their continental congeners : the two races are entitled to subspecific rank. In some instances the British sub-

species is sedentary and the continental form touches our shores as a bird of passage; thus they fall as species into the second class of residents, those which are stationary and migratory. The great-titmouse and hedge-sparrow are birds which appear to show this racial difference in habit. Insular segregation has reached its height in the sedentary red-grouse; it has become restricted in area in the Irish races of the jay and dipper, and still more in the two wrens which are confined to the island groups of St. Kilda and Shetland. But a nominally British subspecies is not necessarily non-migratory; there is considerable evidence to support the conclusion that the so-called British forms of the redbreast and song-thrush are also regular migrants, however sedentary some individuals of these races may be.

The difficult work of tracing the complicated movements of certain species was accomplished by Mr. Eagle Clarke,¹ and his results put an entirely new aspect of the subject before the ornitho-



GENERAL AUTUMN MOVEMENTS OF THE STARLING.

- British nesting bird.
- Immigration from Central Europe.
- Immigration from North-west Europe.
- Passage from Northern to Southern Europe.

The arrows do not indicate actual routes, but merely general direction of movements.



GENERAL SPRING MOVEMENTS OF THE STARLING.

- Immigration of birds which nest in Britain.
- Emigration of Winter Visitors to Central Europe.
- Emigration of Winter Visitors and Birds of Passage to North-west Europe.

The arrows do not indicate actual routes, but only general direction. Spring emigration is less noticeable than autumn immigration.

logical public. Birds like the song-thrush and starling, to mention two, though resident as species (in the sense that they are always present in the country), were shown to perform, as individuals, complicated and varied movements. As individuals they were stationary, sedentary, or performing local and restricted migrations; they were summer visitors, winter visitors, and birds of passage. The complication of these movements is perhaps most noticeable on our south-eastern shores, for at the Kentish Knock Lightship birds of the same species are to be seen travelling in directly opposite directions—an emigratory stream travelling in a south-easterly direction meeting and passing an immigratory stream which is flowing west or north-west. The recovery of ringed birds proves that with some species—the song-thrush is a good example—individuals from a given area may not all follow the same route or even partake

¹ First published, *British Association Reports*, 1900-1903; revised and enlarged, *Studies in Bird Migration*, 1912.

without exception in the migratory habit. Song-thrushes ringed in Britain have been recovered as more or less sedentary residents, whilst others have travelled to France or Portugal.

In the following list of the resident species, those which are also represented in our area by individuals coming as summer visitors are marked S.; those which are also winter visitors, W.; and birds of passage, P.¹

Raven. W.	Creep ² .	Kingfisher. W.	Moorhen. S. P.
Carrion-crow. W.	Wren. W. P.	Wood-pigeon. W.	Coot. ¹¹
Hooded-crow. W.	Dipper. ²	Stock-dove. W.	Capercaillie.
Rook. W.	Mistle-thrush. S. W. P. ⁷	Rock-dove.	Black-grouse.
Jackdaw. W.	Song-thrush. S. W. P. ²	Razorbill. ⁹	Red-grouse.
Magpie.	Blackbird. W. P.	Guillemot.	Ptarmigan.
Jay. W. ²	Stonechat. P. ²	Black-guillemot.	Pheasant.
Chough.	Redbreast. W. P. ²	Blackheaded-gull. S.	Partridge.
Greenfinch. S. W.	Dartford-warbler.	W. P.	Redlegged-partridge.
Hawfinch. S.	Goldcrest. W. P. ²	Common-gull. W. P.	Golden-eagle.
Chaffinch. S. W. P.	Hedge-sparrow. W. P. ²	Herring-gull. P. ²	Whitetailed-eagle. P.
Goldfinch. S. W. P.	Starling. S. W. P.	Lesser blackbacked-gull. S. P.	Marsh-harrier. P.
Siskin. W. ³	Longtailed-tit. ²	Great blackbacked-gull. P.	Hen-harrier. P.
Lesser-redpoll. W.	Great-tit. W. ²	Kittiwake. W. P.	Sparrow-hawk.
Twite. W.	Coal-tit. W. ²	Great-skua. W.	Buzzard. W. P.
Linnet. S. W. P.	Marsh-tit.	Richardson's skua. W.	Kite. P.
House-sparrow. ⁴	Willow-tit. ²	P.	Osprey. P.
Tree-sparrow. W. P.	Blue-tit. W. P. ²	Woodcock. S. W. P.	Peregrine. S. P. ²
Crossbill. ^{5 2}	Crested-tit. ²	Common-snipe. W.	Merlin. W. P.
Bullfinch. W. P. ²	Nuthatch.	Ringed-plover. W. P.	Kestrel. P.
Corn-bunting. S. P.	Bearded-tit.	Golden-plover. W. P.	Greylag-goose. W. P.
Yellow-bunting. W.	Green-woodpecker.	Lapwing. S. W. P.	Mute-swan. ¹²
Cirl-bunting.	Great spotted-wood-pecker. W. ²	Oystercatcher. W. P.	Shelduck. W.
Reed-bunting. S. W. P.	Lesser spotted-wood-pecker.	Dunlin. S. W. P.	Mallard. W. P.
Snow-bunting. W. ⁶	Barn-owl. W. ²	Ruff. S. W. P. ¹⁰	Gadwall. W. P.
Skylark. S. W. P. ²	Tawny-owl.	Redshank. S. W. P.	Shoveler. W. P.
Woodlark. S. P.	Longeared-owl. W.	Greenshank. S. W. P. ¹⁰	Pintail. W. P.
Pied-wagtail. S. W. P.	Shorteared-owl. W.	Curlew. W. P.	Teal. W. P. ²
Grey-wagtail. W. P.	Little-owl. ⁸	Water-rail. W. P.	Wigeon. W. P.
Meadow-pipit. S. W. P.			Pochard. W. P.
Rock-pipit. W. P. ²			Tufted-duck. W. P.

¹ Considerable difference of opinion, due to insufficient knowledge of migration of many species, makes these signs somewhat arbitrary. For instance, the woodlark is marked as also a bird of passage, though the evidence in support of this assertion is at present slender; the more closely allied subspecies are not treated separately, thus the song-thrush is considered as a resident, and the continental song-thrush is not placed as a distinct species in the list of winter visitors; the migratory form of the barn-owl is treated as a winter visitor though its occurrence is irregular.

² Migratory races of these birds are subspecifically distinct from the forms which breed in Britain.

³ Best known as a winter visitor.

⁴ An irregular migrant in large numbers.

⁵ Migratory movements suspected.

⁶ Winter visitor, with a small Scottish breeding area.

⁷ In species which are resident and winter visitors are usually also summer visitors; southerly breeding pairs emigrating for the winter.

⁸ Immigration suspected.

⁹ The pelagic movements of auks, gulls, and many ducks not really understood; their travelling may be more regular than is suspected, and take them to regions beyond our area, although individuals are present at all seasons.

¹⁰ Few pairs nest; much better known as passage birds.

¹¹ Probably some leave our area.

¹² Immigration from Western Europe suspected.

Eider. W.	Heron. W. P.	Great crested-grebe.	Little-grebe. W.
Scoter. W. P.	Bittern. W. P. ¹	S. W. P.	Blackthroated-diver. W.
Goosander. W.	Cormorant.	Slavonian-grebe. W. P. ²	P. ²
Redbreasted-merganser. Shag.		Blacknecked-grebe. W.	Redthroated-diver. W.
W. P.	Gannet. P.	P. ²	P. ²

The internal movements of some of the residents, their winter wanderings and subsequent return to breeding stations within the British Isles, are not easy to separate from their longer travels which may lead them overseas, but pied-wagtails, meadow-pipits, greenfinches, chaffinches, and reed-buntings are observed in passing flocks in many inland districts long before there is evidence of spring immigration on the coast. At favoured food-bases, which are often deserted from late autumn until January, flocks begin to arrive in February. There are few better spots for the observation of these fluctuations than the sewage-farms of the larger towns.

VI. SUMMER VISITORS

The summer visitors are birds which spend the breeding season in Britain and winter elsewhere. The reappearance of these birds in spring, after a temporary absence, first attracted the attention of the earlier field-naturalists to migration. The sudden autumnal abundance of the winter visitors—woodcock, geese, and ducks—had no doubt been noted earlier by predatory

man, but the philosophy of the subject interested him less than the fact that at this season his food-supply was augmented.

Immigration of summer visitors begins in March and lasts until the beginning of May, but the arrival of the migratory resident species and the birds of passage dates from February until well into June.

Most of the summer visitors winter in Southern Europe or Northern Africa, but definite knowledge is lacking of the extent of the individual wanderings of any British species. It was known, for instance, that a swallow, indistinguishable from the swallow which nested in England and had a breeding range far to the north of our islands, occurred in winter in South Africa, but it was also found wintering in Tropical Africa and India. It was mere guess work to say whence these South African swallows came. Two opposite theories were formulated. The first suggested that the whole body of swallows moved southward in autumn, all performing a journey of more or less similar length. Thus the North European and the British swallows would only reach Tropical Africa, and the Southern European and Northern African nesters would be those which were seen at the Cape.

The other theory was that towards the centre of the range the birds would be more likely to be sedentary, and that those which nested in far northern latitudes would pass over these short-journey birds, seeking winter quarters to the far south, which would correspond in conditions with those they had inhabited during the nesting



SPRING IMMIGRATION AND PASSAGE OF THE SWALLOW.

→ Summer Visitors.
→ Birds of Passage.

The arrows do not indicate actual routes, but merely general direction.

¹ Best known as winter visitor. The American bittern is a rare vagrant.

² Only breed in restricted areas ; best known as migrants, especially on passage.

season: the farther north the bird nests the farther south it winters, was the contention of this school. Neither argument is supported by the recovery in Natal of a swallow which was ringed in Staffordshire, though either theory may be correct for other species.¹ This single instance proves nothing, except the foolishness of unsupported theories, but it indicates and paves the way towards the discovery of further facts.

Many European and Asiatic summer visitors travel from Central and Southern Africa along the fertile Nile valley and cross the Mediterranean at various points, but the actual track of the northward bound British summer visitors still awaits elucidation. Ringed birds have been recovered in Portugal and France, and vast numbers of northward bound migrants follow the shores of the Iberian Peninsula and Western France. This is probably the main route by which they reach the English Channel, which is crossed to the southern shores of England and south-eastern Ireland. This class, and indeed all the others, includes birds of many widely differing orders, subsisting upon varied foods, although the majority of insect-feeders are forced to be migratory when the lands in which they nest cease to provide sufficient food for their winter needs.

A few of the regular summer visitors remain to winter in England in exceptionally mild seasons—the chiffchaff, blackcap, and stone-curlew are examples—but this habit is exceptional, and these birds must be looked upon as normally absent in winter.

If the reports and maps, published annually by the Migration Committee as bulletins of the British Ornithologists' Club, which describe and depict the movements of the immigrant summer visitors be studied, it will be seen that the first arrival of any particular species is seldom an indication of large and general distribution throughout the country. A vanguard, usually a small movement numerically, arrives early, but it is followed by one, two, or more waves of incoming birds which spread inland and northwards. In 1905, for instance, the first body of willow-warblers appeared between March 31st and April 8th, but this wave had not far-reaching effect. Between April 9th and 14th a second wave struck the whole length of the south coast, and by the 13th its margin, flowing north-west, was reaching North Wales, Cheshire, Lancashire, and even Westmorland, though its eastward advance was slower. At the end of April, when the winds were strong from the S.W., willow-warblers were again arriving in large numbers, but this later wave was supposed to be mainly composed of birds of passage, the observations at the lights showing the existence of a simultaneous emigratory wave. At that time the writer was watching the west coast movements on the western shores of Anglesey. During the night of May 1st-2nd the wind veered to the N.W., and on the morning of the 2nd was blowing from the N. On that morning the whole of the land near the shore was full of willow-wrens, which had, no doubt, been stopped or driven eastward when travelling northward over the Llyn Peninsula.

In the same year the chiffchaff arrived in no fewer than six well-marked waves, the advance of which were all noticeable throughout the country. The first, on March 20th and 21st, was slight, and the fifth, the largest, struck the coast from Devon to Sussex in an extended front between the 21st and 25th of April.

Many of the summer visitors are also represented in our area by birds of passage. These are marked P. in the following list. A few of them—the petrels and fulmar—are pelagic in their winter wanderings, and some may be met with in winter in territorial waters.

Yellow-wagtail.	Tree-pipit. P.	Whinchat.	Whitethroat. P.
Blueheaded-wagtail. P. ²	Ring-ousel. P. ³	Redstart. P.	Lesser-whitethroat. P.
White-wagtail. P.	Wheatear. P. ³	Nightingale.	Blackcap. P.

¹ *British Birds*, vol. vi. p. 277.

² Four subspecies of *M. flava*, in addition to the yellow-wagtail, have occurred in the British Islands.

³ The northern willow-wren, a local race, is a regular bird of passage, and distinct geographical races of other species marked occur as irregular visitors.

Garden-warbler. P.	Swallow. P.	Roseate-tern.	Spotted-crake. P. ²
Chiffchaff. P. ¹	House-martin. P.	Sandwich-tern. P.	Quail. P. ³
Willow-wren. P. ¹	Sand-martin. P.	Little-tern. P.	Montagu's harrier. P.
Wood-warbler.	Wryneck. P.	Stone-curlew. P.	Hobby. P.
Reed-warbler. P.	Swift. P.	Rednecked-Phalarope.	Honey-buzzard. P.
Marsh-warbler.	Nightjar.	P.	Garganey. P.
Sedge-warbler. P.	Hoopoe. P.	Dotterel. P.	Storm-petrel.
Grasshopper-warbler.	Cuckoo.	Kentish-plover. P.	Leach's forktailed-
Golden-oriole. P.	Turtle-dove.	Common-sandpiper.	petrel. P.
Redbacked-shrike. P.	Puffin.	Whimbrel. P.	Manx-shearwater. P.
Spotted-flycatcher. P.	Common-tern. P.	Corncrake.	Fulmar.
Pied-flycatcher. P.	Arctic-tern. P.		

VII. WINTER VISITORS

The winter visitors are birds which do not nest in the British Islands, but come to us for a more or less prolonged stay during the colder season. When the summer visitors are leaving our shores from East Anglia to Land's End and the southern coasts of Ireland, the winter visitors are arriving on our east and north-east seaboard, accompanied by birds which as individuals are winter visitors but which belong to species which are resident; also by many birds of passage on the way from breeding quarters in the far north to winter quarters south of the British Isles. Streams from Iceland, Greenland, and the north-west, from Scandinavia, the Baltic Provinces, Russia, and Siberia, strike the coast at various points from the Shetlands southward. Outlying islands, such as Fair Island and the Isle of May, become important observatories, for it is evident that many of the southward hurrying birds intentionally or accidentally reach these islands as refuges for rest and food.

The best known of our winter visitors, including many which are also sedentary residents, distribute themselves throughout our islands, finding in them a food-supply sufficient for their winter needs. Some of these, such as the mealy-redpoll and brambling, will in some winters entirely desert our islands, becoming for the time purely birds of passage, whilst the siskin, snow-bunting, and some others, which have already been classed as residents on account of their constant presence as a species, are much better known in their habit of visiting us for the winter. The majority of the winter visitors are also birds of passage (marked P. on the list), and some of them—for example, the waxwing—are so irregular in their appearance that they might almost be classed amongst the irregular visitors.

Brambling. P.	Snowy-owl.	Jack-snipe.	Bartailed-godwit.
Mealy-redpoll. P. ⁴	Little-auk.	Grey-plover. P.	Greenland-falcon. ⁴
Shore-lark. P.	Little-gull.	Turnstone. P.	Whitefronted-goose. P.
Redwing. P.	Glaucous-gull.	Purple-sandpiper.	Bean-goose. P.
Fieldfare. P.	Iceland-gull.	Knot. P.	Pinkfooted-goose. P.
Black-redstart. P.	Pomathorine-skua. P.	Sanderling. P.	Barnacle-goose. P.
Waxwing. P.	Buffon's skua. P.	Green-sandpiper. P. ⁵	Brent-goose. P. ⁴

¹ The northern willow-wren, a local race, is a regular bird of passage, and distinct geographical races of other species marked occur as regular visitors.

² Also occasionally a winter visitor, so might be classed as a resident.

³ The passage movements of the quail are irregular, but the bird has occurred in winter, and it is subject to fluctuations in number which suggest irruptions.

⁴ Other forms recognised as irregular visitors.

⁵ In most places best known on passage. For evidence of its occurrence as a winter visitor, see Coward, *Vert. Fauna of Cheshire*, i. 408.

Whooper-swan. P.	Goldeneye. P.	Smew.	Great northern-diver. P.
Bewick's swan. P.	Longtailed-duck.	Rednecked-grebe. P.	Great-shearwater. ¹
Scaup. P.	Velvet-scooter. P.		

The sooty and Levantine-shearwaters may be classed as winter visitors, but their appearance, though not infrequent, is mainly autumnal. Like the great-shearwater, they reach us from more southern breeding areas.

VIII. BIRDS OF PASSAGE

The birds of passage, or "spring and autumn" migrants, which treat our hospitable islands as places of rest and refreshment on a longer journey to and from northern breeding haunts and southern winter quarters, form a large and important class, mainly composed of species which are represented in Britain by individuals already referred to in other divisions. These passage birds may travel slowly through inland districts; they may loiter along our shores, or they may merely pay a hurried visit, for rest or food, to some convenient bay, headland, or islet. On the spring passage birds like the Greenland-wheatear, whimbrel, and sanderling, bound for far north, are in no hurry to leave our food-supplying land before the vernal isotherms have made the North habitable. Immature and non-breeding examples of winter visitors and birds of passage, such as the curlew-sandpiper, knot, turnstone, and sanderling, not infrequently remain throughout the summer on our shores; and, indeed, many of these are classed as winter visitors, because individuals (numerous enough at times) make our islands the southern limit of their winter wanderings, although others of their species may proceed far south of the Equator.

The birds of passage travel northward by both the east and west coasts of Britain, and along either coast of Ireland, while many travel overland. Some continue to the Orkney and Shetland Islands, where the routes divide, one stream leading eastward towards the Norwegian shores, and the other north-west towards Iceland. Many east coast travellers leave our shores long before they reach Northern Scotland. Some may leave for the Dutch and Belgian shores from East Anglia, but a larger number split off from the Humber northwards, and strike diagonally towards the Baltic or the Scandinavian Peninsula across the North Sea.

The task of making a list of the *regular* birds of passage is a most difficult one, and is subject to the criticisms of any ornithologist who may hold particular views about the regularity of appearance or the stability of the route of any particular species. The following birds have, in the writer's opinion, occurred a sufficient number of times, and have recurred at the same season in the same locality with sufficient regularity to warrant their inclusion as regular visitants on passage migration to our area. As the study advances others, now simply included as accidental or casual visitors, will be shown to have equal claim.

Scarlet-grosbeak.	Barred-warbler.	Little-stint.
Ortolan-bunting.	Great grey-shrike.	Temminck's stint.
Little-bunting.	Woodchat.	Curlew-sandpiper.
Lapland-bunting.	Redbreasted-flycatcher.	Wood-sandpiper. ²
Richard's pipit.	Roller.	Spotted-redshank.
Tawny-pipit. ²	Black-tern.	Blacktailed-godwit.
Water-pipit.	Whitewinged black-tern.	Roughlegged-buzzard.
Firecrest.	Sabine's gull.	Honey-buzzard.
Norwegian-bluethroat.	Grey-phalarope.	Spoonbill.
Yellowbrowed-warbler.	Great-snipe.	Glossy-ibis.
Icterine-warbler.	Avocet.	

¹ Really a winter visitor from its southern breeding haunts south of the Equator, its winter being our summer.

² Has bred in Britain.

IX. IRREGULAR VISITORS

Irregular visitors do not occur on our shores at any particular season, for their movements are influenced by various factors. Some of these movements are recurrent at long intervals, and partake of the nature of irruptions or invasions. The sporadic invasion of our islands, and indeed of the whole of Western Europe, by hordes of Pallas's sandgrouse is probably the most extraordinary of these irruptions; excessive fecundity of the species in its eastern breeding area appears to occasion this attempt to colonise a wider field—an attempt which invariably ends in failure. The extraordinary visitation in certain years of crossbills, waxwings, even bramblings and siskins, as well as marked occurrence in numbers of the ruddy-shelduck, are also suggestive of sporadic invasion.

Amongst these irregular visitors must be classed a large number of birds which have occurred on one or more occasions, but which do not arrive with sufficient regularity to be included in the list of birds of passage. Mr. Eagle Clarke lists 53 from Continental Europe, 17 from Asia, 2 from Africa, 29 from North America, 9 from the Arctic regions, and 10 from Southern Oceans.

These numbers may be increased or decreased according to the judgment of any ornithologist, for there are many birds which were treated as casuals a few years ago, but are now known to be regular visitors. The barred-warbler is a good example. Prior to 1879 it was unknown in Britain. Twenty years later Saunders enumerated twelve occurrences, and by the beginning of 1912 the number had risen to thirty-two. Since the publication of the *Hand-List*, the preface of which is dated April 1912, no fewer than twenty have been observed. Is it to be considered as a lost or accidental wanderer any longer? Has it not been overlooked in the past?

The remarkable work accomplished by Mr. Eagle Clarke and his assistants at Fair Island, the Flannans, St. Kilda, and elsewhere, and by the Misses Rintoul and Baxter at the Isle of May, has added many unexpected recurrences of these "vagrants," and it is no idle guess to state that far more must have passed unnoticed. In 1899 Saunders said that the blueheaded-wagtail "can hardly be considered as more than an irregular visitor on migration"; now it is classed with regular summer visitors and birds of passage. Blyth's reed-warbler and the Scandinavian chiffchaff were included in the *Hand-List* (April 1912) on the strength of single occurrences at Fair Island and the Isle of Wight. Fair Island has since produced four or five of the former, one has occurred at Holy Island and one in Holderness, while Mr. Eagle Clarke says of the chiffchaff that "it appears to be a regular migrant" at Fair Island, and several have occurred on the Isle of May.

The more systematically that ornithologists work, the more of these so-called "vagrants" or "gypsy-migrants" will have to be included as regular birds of passage. This remark applies most to those which reach us from Continental Europe and North Asia, for it is reasonable to recognise the birds whose normal range extends no farther than South or even Central Europe and Africa as lost wanderers when they appear in Britain. The subalpine warblers which travelled from Southern Europe to St. Kilda and Fair Island are instances of birds wandering, hopelessly lost, farther and farther from their base, and an even more striking instance is that of the masked-shrike, which, on leaving winter quarters in Africa for its Asiatic summer home, found its way to the Kentish shore.

Mr. Eagle Clarke says of the American visitors, that those "which find their way to our shores *unaided* are birds which have a high northern summer range, and they doubtless reach us after having travelled by way of Greenland, Iceland, and the Færoes, not by an impossible passage across the open Atlantic. In this way their voyages are not more wonderful than those annually performed by the wheatear, redwing, whimbrel, and others along similar lines of

flight." Whether it is wise to say "impossible" in the face of evidence which we possess of the journeys of the American golden-plover and other waders, is open to question;¹ but with regard to the majority of the American visitors it is evident that they made an error at the start, and probably joined some band of south-eastward bound regular migrants instead of travelling with their own kind in a south-westerly or southerly direction. Wind may drift birds from their normal pathway at any point on their passage, and this fact probably accounts for the frequent occurrence of ordinary east-coast birds of passage on our western seaboard and in Ireland. It is, however, a fact that the west-coast passage has received less attention than that on the east.

The question as to whether a bird is out of its course or on its ordinary route depends largely upon how far the existence of direct migration pathways is admitted, or how wide or narrow these pathways are believed to be. In some autumns certain species are more abundant on passage on the east coast than in others; this applies to regular visitors like the grey-crow, shore-lark, and brambling, as well as to rarer "vagrants." Either the numbers of these birds are subject to great fluctuations or they only travel by this route in some seasons. Others of the same species are known to voyage along the eastern borders of the North Sea, and it is probable that the numbers which take one passage or the other are regulated by the direction and force of the wind at the time of departure, deviating the stream to one coast or the other. The arguments that the direction of the wind has no influence at all upon the birds, but that force alone acts as a stimulant or deterrent, are not convincing. The route in this case is the whole of the North Sea, but most of the travellers move along one or other side-track, where they may obtain food and rest, rather than brave the dangers of the central landless roadway.

Lastly, there are a number of petrels, shearwaters, and other pelagic birds, nesting in some cases in the South Atlantic or even Pacific, which have wandered into the North Atlantic and been recorded for Britain. These birds have hardly found their way to our shores, they have lost their way until they found themselves stranded here; their casual wanderings have little association with true migration. With a few it is different; the great and sooty-shearwaters, for example, are regular northward migrants in the autumn; they wander in search of food from their southern breeding haunts in exactly the opposite direction to the Arctic-tern, which from its arctic and northern home, which has a southern limit in our islands, travels during our winter so far as the Antarctic. The explanation is very simple; these two shearwaters, and some others which come more rarely, are birds of the southern hemisphere.

The following list by no means includes all the birds which are upon the British List; it is divided into two, the first portion including those species which have occurred so frequently that even if we admit them as "vagrant," their wanderings suggest regularity of movement towards the British area. The second portion includes a number of species which have been observed on a few occasions only, and whose journey to our islands was probably caused by influences affecting individuals rather than species. Many of these extraordinary occurrences are probably due to the errors of youth, which almost invariably means subsequent death for the individual.

LIST I.

Serin.	Whitewinged-lark.	Rock-thrush.	Blyth's reed warbler.
Pine-grosbeak.	Short-toed-lark.	Whitespotted-blue-throat.	Aquatic-warbler. ²
Blackheaded-bunting.	Crested-lark.	Alpine-accentor.	Melodious-warbler.
Meadow-bunting.	Redthroated-pipit. ²	Great-reed warbler.	Rosecoloured-starling.
Rustic-bunting.	Wallcreeper.		Alpine-swift.

¹ See Coward, *The Migration of Birds*, 1912, pp. 119-121.

² These, and probably others, may be classed as regular birds of passage.

Bee-eater.	Bartram's sandpiper.	Little-crake.	Surf-scooter.
Tengmalm's owl.	Pectoral-sandpiper.	Baillon's crane.	Purple-heron.
Scop's owl.	Bonaparte's sandpiper.	Goshawk.	Little-bittern. ¹
Snowy-owl.	Buffbreasted-sandpiper.	Iceland-falcon.	Night-heron.
Sandgrouse.	Broadbilled-sandpiper.	Lesser-kestrel.	White-stork.
Brunnich's guillemot.	Redbreasted-sandpiper.	Redfooted-falcon.	Black-stork.
Ivory-gull.	Blackwinged-stilt.	Snow-goose.	Whitebilled northern-diver.
Creamcoloured-courser.	Crane.	Ruddy-shelduck.	
Pratincole.			

LIST II.

Nutcracker(two forms).	Pallas's grasshopper-warbler.	Great blackheaded-gull.	Lesser whitefronted-goose.
Hornemann's redpoll.	Lanceolated-warbler.	Blackwinged-pratincole.	Redbreasted-goose.
Coues's redpoll.	Orphean-warbler.	Caspian-plover.	Bluewinged-teal.
Citril-finch.	Sardinian-warbler.	Little ringed-plover.	American-wigeon.
Parrot-crossbill.	Subalpine-warbler.	Killdeer-plover.	Redcrested-pochard.
Snow-finch.	Rufous-warbler (two forms).	American golden-plover.	Ferruginous-duck.
Pine-bunting.	Lesser grey-shrike.	Asiatic golden-plover.	Buffleheaded-duck.
Yellowbreasted-bunting.	Masked-shrike.	Sociable-plover.	Harlequin-duck.
Siberian meadow-bunting.	Brown-flycatcher.	American-stint.	Steller's eider.
Largebilled reed-bunting (two forms).	Collared-flycatcher.	Baird's sandpiper.	King-eider.
Black-lark.	Redrumped-swallow.	Semipalmated-sandpiper.	Hooded-merganser.
White's thrush.	Needletailed-swift.	Spotted-sandpiper.	Great white-heron.
Dusky-thrush.	Egyptian-nightjar.	Solitary-sandpiper.	Little-egret.
Blackthroated-thrush.	Hawk-owl (two forms).	Yellowshank.	Buffbacked-heron.
Desert-wheatear (two forms).	Eagle-owl.	Greater-yellowshank.	Squacco-heron.
Blackeared-wheatear (two forms).	Great spotted-cuckoo.	Marsh-sandpiper.	Flamingo.
Pied-wheatear.	Yellowbilled-cuckoo.	Eskimo-curlew.	Madeiran forktailed-petrel.
Isabelline-wheatear.	Blackbilled-cuckoo.	Slenderbilled-curlew.	Wilson's-petrel.
Black-wheatear.	Rufous turtle-dove.	Great-bustard.	Frigate-petrel.
Thrush-nightingale.	Whiskered-tern.	Little-bustard.	Little dusky-shearwater.
Greenish-warbler.	Gullbilled-tern.	Macqueen's bustard.	Mediterranean great-shearwater.
Eversmann's warbler.	Caspian-tern.	Carolina-crake.	Schlegel's petrel.
Pallas's warbler.	Sooty-tern.	Spotted-eagle.	Capped-petrel.
Radde's bush-warbler.	Wedgetailed-gull.	Black-kite.	Collared-petrel.
Cetti's warbler.	Bonaparte's gull.	Griffon-vulture.	Bulwer's petrel.
Savi's warbler. ²	Mediterranean black-headed-gull.	Egyptian-vulture.	Blackbrowed-albatros.

X. MOVEMENTS DUE TO SEVERE WEATHER

During winter any sharp spell of frost or heavy fall of snow will occasion extra migration of ground-feeding and indeed most birds—both resident and winter visitors. The volume of a movement depends upon the severity of the climatic variation which occasions it. The birds

¹ These, and probably others, may be classed as regular birds of passage.

² Formerly a summer visitor.

which are largely influenced—thrushes, finches, larks, lapwings, and golden-plovers—may pass westward towards the warmer peninsulas of Lleyn or Cornwall, or they may continue westward to the mild Irish shores. In the same way exceptionally severe weather in northern or north-western Europe will cause a late emigration to our eastern coasts, which frequently takes the form of winter “rushes,” which, however, are less extensive in area and numbers than the rushes in autumn.

Normal migration, whether in autumn or spring, is even-flowing and steady, and in consequence not easy to observe. When the travellers are not hurried by adverse weather or by the sudden falls in temperature after a warm but stormy spell, which had held them up at some point of departure, they steadily move towards our shores, along them, or through the country in small parties, and stop to feed wherever food is plentiful. On the east coast in autumn we may look out seawards over a birdless waste of water. A few specks to the east, or more frequently to the north-east, catch the eye, and if we watch these specks we see them growing larger and more distinct. As they approach nearer we distinguish them as birds, then note their particular species—some day-migrants, lapwings, skylarks, or grey-crows perhaps. They reach the shore, pass steadily overhead, and alight on some field, often where others of their species have already gathered to feed. Under ordinary conditions they show no sign of fatigue, but now and then a tired straggler is met with, which has hardly power to fly when approached. Many migrants come in during the night or early morning, and it is in the early hours that we may note the changes in the avian population of any particular district caused by the nocturnal immigrants. During the daytime the passage of coasting birds may be noticed. Swallows and martins skim along the shore, snapping up insects here and there, but seldom changing their general southward direction for more than a short diversion to right or left; lesser blackbacked-gulls stream past over the sea in parties varying in number, or ducks and waders in more or less ordered flocks swing by over the waves. It is only possible to judge that these birds are migrating from their constant arrival from the north and movement towards the south.

When, however, numbers of birds have accumulated at a point of departure, owing to meteorological conditions unfavourable for oversea travel, and some favourable change releases them, there is a hurried departure. It is then that the passage or arrival of hastening migrants is most easily observed; it is then that migration becomes forced and abnormal; it is then that the perils of the frail travellers are increased, and many join the great army of the unfit, fall out of the race, and perish.¹

¹ I am indebted to Mr. J. L. Bonhote and Rev. F. C. R. Jourdain for suggesting a few alterations, especially in the classification of the migrants. [T. A. C.]

STUDY OF BIRD BEHAVIOUR

WITH A BIRD-WATCHER'S GUIDE¹

[F. B. KIRKMAN]

I. INTRODUCTORY

IN order to study birds in the wild state successfully, it is obviously not enough to go forth with a binocular and watch them. One has to watch with a seeing eye. To do this it is necessary to know what to look for; there must be in one's mind definite questions to answer. To go forth in search of facts needed to answer definite important questions, be the questions great like those which occupied the mind of Darwin, or be they small, is an essential condition of success in natural history.

The fundamental questions that face the student of the behaviour of birds are the same as those which face the student of animal behaviour in general. A brief statement of the nature and scope of this latter study must here suffice to indicate what these questions are.

The word "behaviour," as commonly understood in this context, comprises all the bodily activities of the animal considered as a unit—*e.g.* its gestures, ways of feeding, of protecting itself, of playing.² The word "animal" includes, of course, man. It is important, further, to note that animal behaviour is not necessarily associated with consciousness or mental process. It is conceivable that the lowest forms of animal life are without consciousness.

There are three kinds of animal behaviour commonly distinguished—instinctive, intelligent, and rational. Instinctive behaviour is inherited or congenital. A familiar example is supplied by the ejection of its fellow-nestlings by the young cuckoo, which is able to perform this feat without previous experience; it has no means of learning how to do it. The complex nervous-muscular co-ordination involved is entirely inherited.

Every animal, including man, comes into the world with a certain stock of instinctive ways of behaving. This ready-made behaviour is, except in the case perhaps of the lowest forms of life, capable of modification by experience. A chick just out of the egg will peck instinctively at any small object within reach, whether it be eatable or not. Now if its instinctive behaviour were incapable of modification, it would continue throughout its life to peck at a number of useless objects only to have to drop them. This is not what happens. The chick learns to recognise uneatable objects and to leave them untouched, thus saving itself much unprofitable exertion. It learns by experience. Its behaviour, in so far as thus learnt or acquired, is termed intelligent to distinguish it from instinctive behaviour, which is not learnt but inborn. Those intelligent acts which become "mechanised" by repetition are termed "habits."

The distinction between intelligent and rational behaviour is more difficult to define. It lies chiefly in the capacity or incapacity to form a mental image sufficiently free to enter into

¹ My thanks are due to Professor Lloyd Morgan for very valuable comments on the matter of this chapter.

² Excludes, therefore, in the restricted sense here used, the activities of the animal's bodily parts considered as units (cell unit, organ unit).

new combinations, to form part, that is, of a reasoning process. An example will show what is meant. A dog sees its master standing with a stick in his hand and calling in a loud and angry voice; it thereupon puts its tail between its legs and grovels or runs. Obviously the dog is unable to form a verbal inference; it cannot reason, "My master is angry, has a stick; is, therefore, going to beat me," for it has no word-imagery. But can it form a mental picture of the stick playing on its back as last term in the process: master angry, stick? If it can form such an image, it is, according to the definition, capable of rational behaviour. If it cannot, if it has learnt by painful experience merely to attach a meaning to certain proceedings on the part of its master, to associate them with unpleasant consequences, to recognise them as ominous without, however, being able to recall mentally the act of flagellation, then it is incapable of rational behaviour; it lacks the power of mental imagery without which no higher mental life is possible. Its behaviour, in so far as not instinctive, is intelligent, and depends always upon an object actually perceived, that is present to one or more of the organs of sense. It is not here implied that a rational being would necessarily take the trouble to form a mental image under the above circumstances, or even a verbal inference, which is only another form of mental imagery. But the capacity to form the mental image would be there, and it is the necessary condition of any process of reasoning that involves an object not actually perceived.

Of the three kinds of behaviour, the instinctive is the most primitive. The life of the lowest animals appears to be almost wholly, if not wholly, of this kind. But in the very nature of things instinctive behaviour cannot suffice, for environment is not constant, and hence the little round of instinctive acts that are adapted to a given environment become useless or positively dangerous, when for some reason or other that environment changes, or the creature moves into another. A stone-curlew, crouching instinctively on its native waste, escapes detection owing to its concealing coloration. Turn the waste into green pasture, and the bird's instinctive crouching causes its destruction. It is here that intelligence comes to the rescue. If a species has sufficient innate plasticity to enable it to modify its instinctive behaviour to suit new conditions, it survives; if not, it perishes. And most have perished, if our reading of the geological record is right.

Rational behaviour succeeds intelligent. But at what point in the scale of animal life? Has any animal below man the power to form a mental image? This is still an open question. A great mass of experimental evidence bearing on the point has in recent times been collected, chiefly by American workers, but no convincing result has been reached.¹ There can be little doubt that the behaviour of animals below man is, apart from a doubtful element of rationality, mostly a complex of instinctive and intelligent, and it is by no means easy in given cases to be sure where the one begins and the other ends.

The chief questions that face the student of animal behaviour, and consequently of bird behaviour, will be already apparent. Firstly, is this or that act instinctive, intelligent, or rational? For example, to what extent is the art of nest-building inherited, to what extent acquired by experience? Secondly, what is the origin of the three kinds of behaviour? Is rational behaviour evolved from intelligent, and this again from instinctive? How did the instinctive arise? Is there, in short, continuity of development in animal behaviour, and what is its origin? Finally, one might go further and ask, what is the relation between behaviour and the associated conscious states, between nervous process and mental process, body and mind? but this question of questions takes us outside the scope of our study.

Such are the fundamental questions, and to answer them many subsidiary questions must be put. A list of some of those which have reference to the study of bird behaviour will be found below. To answer a few of them might well occupy the leisure of a lifetime.

If to have in one's mind definite questions that call for answer, if knowing what to

¹ For the evidence, see Washburn, *The Animal Mind* (The Macmillan Co., N.Y.), and works there cited.

look for is an essential condition of success in the study of natural history, or of any science, it is not the only condition; there are others that cannot be ignored, and which are almost unconsciously fulfilled in the practice of every good naturalist. One is to record observations with a sole eye to accurate statement, uninfluenced by any prejudice in favour of preconceived theory. Another is to verify. A common error is to argue without hesitation from the individual to the species; it abounds in the pages of the older naturalists, and is not absent from those of the modern. A third condition of good work is to practise with a religious devotion the precept of the immortal Cuttle: 'When found, make a note of.' And add the date. In the study of wild birds and most other vertebrates there is, need I add, peculiar need of two qualities: patience and the ability to keep still.

In drawing conclusions there are two dangers worth noting. The first is the tendency to assume in other animals the mental powers of man. A safe familiar rule is to explain by the simple and more primitive rather than by the higher and more complex. A good example of the danger is to explain origin by utility. For instance, the utility of a bird's nest is that it keeps the eggs close together, so that the whole clutch can conveniently be incubated. To affirm, however, that the primitive bird learnt to build a nest in order to keep the eggs together, is to assume that it was, in the first place, capable of remarking that eggs roll down and not up an incline; and, in the second place, of bearing this fact in mind with a view to the annual construction of its nest. It is difficult to see how it could bear it in mind without forming at least a visual mental image. We have no right at present to assume that it can. The utility of the nest, if it does not explain its origin, may well, however, explain its persistence; the nest survived, or was "selected," because of its fitness for its purpose. Let us add that in this case the affirmation that utility explains the origin of the nest-building instinct involves another unproved assumption, which is not infrequently implicit in the conclusions of naturalists: it is that acquired modes of behaviour can be inherited. The bird having learnt, according to the first assumption, to build its annual nest or nests in order to keep its eggs together, is, according to the second assumption, held capable of transmitting this "habit" to its offspring. There is no proof at present that acquired modifications can be inherited. There is consequently no proof that a habit can become an instinct.

A second danger is the tendency to balance a pyramid of theory on a pin's point of fact, a feat not uncommonly attempted, and with disastrous results. The tentative hypothesis has, of course, its value, but only on condition of its being raised upon a substantial basis.

A few words as to equipment. For those who do not use the camera, this is simple: a note-book, a binocular, and a square of waterproof material, not too large to go into the pocket, that will serve to sit upon. Those who use the camera are referred to the article by Mr. Farren. The camera is a useful adjunct, but its use, however skilful, can never be a substitute for the conditions of success laid down above. A good photographer is not necessarily a good observer. Experience, indeed, has shown on more than one occasion that he may have neither the training nor the capacity for exact observation.

As it is impossible here to deal more than very briefly with the subject of animal behaviour, the reader is referred to the following works:—Professor Lloyd Morgan, *Animal Behaviour*, 1900; *Habit and Instinct*, 1896 (Arnold); Thorndyke, *Animal Intelligence*, 1911; Washburn, *Animal Mind*, 1906 (The Macmillan Co., N.Y.). The latter contains a good bibliography.

II. BIRD-WATCHER'S GUIDE

There are two methods of observation—the direct observation of the animal as a free agent, and experimental observation; the latter differing from the former in that the animal is watched under certain prearranged conditions that can be repeated at will by the observer.

Experimental observation is most easily carried out with domestic or captive animals, and does not here concern us. For a good account of its methods, with many examples, the reader is referred to Washburn's *Animal Mind*, already quoted.

There are two ways of using the following guide: either to take one section or subsection of it and use it as a basis of observation upon a large number of species; or to confine observation to a few species, and extend the scope of the inquiry to several or all sections. In either case, it will prove helpful and save waste of time if the foregoing pages of the *British Bird Book* are consulted in order to find what is already known on the subject chosen, and in what special directions new inquiries should be directed. The Index will make this preliminary labour a matter of no great difficulty.

Under each of the following heads one or more works will be quoted, which will provide an introduction to the subject.

1. GENERAL—CLASSES OF BEHAVIOUR

The general question as to whether any particular form of behaviour is instinctive, intelligent, or rational is placed here to avoid its repetition under each of the following heads. The test of an instinctive act is that it is performed for the first time without having to be learnt. The test of intelligent behaviour is that it is the product of experience, whether this be direct or imitative. One example will illustrate both instinctive and intelligent behaviour. A chick, taken from its mother, therefore without opportunity of imitating, will peck for the first time at any small object within reach. The act of pecking is clearly instinctive. These first instinctive pecks are not perfect; the bird's beak may indeed miss the object, but its aim improves with practice. The improvement is the product of experience, and therefore falls, according to the definition, under the head of intelligent behaviour. The criterion of rational behaviour is the capacity to form a mental image, but here the difficulty is to find any satisfactory way of discovering whether on a given occasion a mental image is formed. In dealing with this part of the subject, the utmost caution in interpreting the animal's behaviour is necessary. See works quoted on p. 598; and for the physiology of nervous structure see W. McDougall, *Physiological Psychology*. (Temple Primers. Dent.)

Imitation.—In recording all cases of imitation, it is important to note that an act done in imitation of another may be instinctive or intelligent. For example, a young bird utters for the first time in its life a note on hearing another young bird of the same species do so. The first bird may be said to imitate in that it follows the example of the second, but it is not *learning* by imitation, for the ability to utter the note is instinctive in the species. The utterance of the second chick simply provides the stimulus that evokes an instinctive response from the first. But if a bird imitates the note of another species, it has learnt to do something it could not do before, which is the product of its experience, and is, therefore, intelligent. Literature: Lloyd Morgan, *Animal Behaviour*, chap. v. § 1; Washburn, *Animal Mind*, p. 237. See also below, 3, § 2, "Song and Notes."

2. GENERAL—ORIGINS

It would be useless to attempt in a few words to explain the difficulties involved in any question of the origin of instinctive and other behaviour. For an adequate statement the reader is referred to Professor Lloyd Morgan's *Animal Behaviour*. See also, for general allied questions, R. H. Lock, *Recent Advances in the Study of Variation, Heredity, and Evolution*, 3rd or later edition (Murray); and J. A. Thomson, *Heredity*, 2nd or later edition.

3. PARTICULAR

1. **Gestures.**—All movements intended to give expression to the bird's conscious states.

(a) *Expression of sex emotions.* Exact descriptions of the gesture (display, attitude, movements). By which sex. How many individuals take part. Are the gestures before and after mating the same? Gestures performed by a bird when alone. Is there display of special features? (plumes, colours, wattles, etc.). Does the hen select, or is she merely appropriated, or does she simply mate with the cock in possession of the nesting area, whether it be her former mate or not? If the hen selects, what appears to govern her selection; has she chosen the strongest, etc.? Does the species under observation pair for life, and, if so, are there sex displays by one or both of the pair? Relation of sex gestures to the act of coition. Is a love gesture made to serve for the expression of emotions other than sexual? Note differences in the gestures made by individuals of a species, and those of species in the same group. Literature: C. Darwin, *Descent of Man*, 2nd edition, chaps. viii., xiii.-xvi.; A. R. Wallace, *Darwinism*, chap. x.; Lloyd Morgan, *Animal Behaviour*, pp. 258-269; J. T. Cunningham, *Sexual Dimorphism in the Animal Kingdom*.

(b) *Expression of states of mind other than sexual.* Exact description of the gestures used to express anger, fear, and any other state of mind other than love. On what occasion. Note case of gestures made to serve more than one purpose, and of gestures with apparently different meanings being used on the same occasion. Can the gesture be explained by any of the three principles laid down by Darwin in his *Expression of the Emotions* (Murray)? See also 6 (c).

(c) *Play of birds.* Exact description, and occasion when used. By young or adult. Age of young. Literature: Lloyd Morgan, *Animal Behaviour*, pp. 248-258; Karl Groos, *Spiele der Thiere*, 1907, 2nd edition (Fischer, Jena); *Play of Animals* (translation of first edition, 1900).

2. **Song and Notes.**—These, like gestures, are means of expression, and have been little studied.

(a) *Song.* Occasions on which used (sex-excitement, fighting, in winter, e.g. robins). For question of instinct, note first efforts of young, all possibility of imitation being excluded. Variation in song of individuals of same species, and same individuals at different times, in respect to length, notes, quality. Analysis of song: how far made up of call-notes, etc.; of new notes; of imitations. Is imitation of the notes of another species (1) normally an important factor in the song of the species observed, (2) only occasionally present, (3) absent. Months when species sings. At night? Does hen sing? When? Literature: Lloyd Morgan, *Habit and Instinct*, pp. 178, 229.

(b) *Notes.* Occasion on which different notes of a species used. Instinctive or acquired? Individual variations in pitch, etc. Differences in notes of sexes, of adult and young. Comparison of notes of related species, especially of the young. This almost impossible, however, without a phonetic notation. For notes as means of intercommunication, see Lloyd Morgan, *Animal Behaviour*, chap. v. § 2.

3. **Nest-building.**—(a) *Nest-area.* Do the pair confine themselves within a definite area? Map of adjacent areas of individuals of same species. Relations of adjacent pairs of same and different species. How are the boundaries of areas determined. Relation to sexual selection theory. See 1 (a). Date on which nest-area left.

(b) *Site.* By which sex chosen. Date on which chosen. Is there final selection from more than one site? (Ways of showing choice. Placing nest material, making scrape in ground going in and out of hole.)

(c) *Nest.* (Definition: any place for the eggs made by the bird. An unlined scrape is a nest, an unlined depression on a rock is not.) Note whether ground nest-scrapes are left unlined, or are lined previous to or after laying; material used. Whether hole nests are lined or unlined;

material. Other nests: material inside and out, and, if any, between the lining and exterior. For all types of nest: where material obtained. Fresh or dry, if vegetable. Is more than one nest made by the same pair? Use of same.

(d) *Building*. By which sex is the ground scrape made. By which lined. If by both, share of each. If one, what does mate do? (See vol. iii. pp. 372-379.) Share of sexes in building hole and other nests. Detailed description of building (scrape, lining; foundation, shaping, collecting material). How long to complete. Interval between completion and laying. Causes of desertion.

(e) *Variation*. Variation within the species with respect to area, site, lined and unlined scrapes, shape, material. For example, see vol. i. pp. 374-380. Differences between species in the same group.

(f) *Instinct and intelligence*. Note if nests of year-old birds, that have no opportunity of imitating others, are those of their species. These can best be observed in captivity; but also in the wild state, if ringed or otherwise recognisable. Note if improvement shown in second and succeeding nests.

(g) *Cleaning of nest*. In what way are the faeces of young disposed of by the parents? Are they eaten or dropped? At what date after birth do parents cease to remove them? Why?

(h) *Second nest*. Is a new nest built for second or later broods? If not, is old nest cleaned or repaired? Is new nest in same nesting area as first?

Literature: C. Lloyd Morgan, *Habit and Instinct*, pp. 232-239; W. P. Pycraft, *History of Birds*, chap. xi. (Methuen); A. R. Wallace, *Natural Selection and Tropical Nature*, chapters on the "Philosophy" and the "Theory of Birds' Nests" (Macmillan). The last named should be read in connection with the first.

4. *Incubation*.—By which sex, share of each. Date on which each egg laid, incubation begins, each egg hatched, the eggs being numbered. Effect of weather, latitude, situation of nest upon date of laying, and period of incubation. Weight of eggs as incubation proceeds. Is incubating bird fed? Are eggs covered when left? Are they turned, how often, in what manner? The information available as to period of incubation and date of laying will be found for each species in the "Classified Notes" of this book. This might be verified, as well as completed.

5. *Nestlings and Fledglings*.—Period in nest. Rate of growth tested by weight and measurements. Immediate cause of departure. Where they go on leaving nest. Relations with parents when preparations for second brood started. Relations with second or later broods. See also "Feeding" and "Protection of Young."

6. *Feeding*.—(a) *Choice of food* is primarily determined by inherited likes and dislikes. But is the selection of the appropriate food a matter of instinct or experience? This is tested by watching young birds, when able to feed themselves, and under conditions that exclude imitation. For observations on nidifugous young see Lloyd Morgan, *Habit and Instinct*, chap. ii., and *Animal Behaviour*, pp. 93-98. Nidicolous fledglings have not been studied.

(b) *Methods of feeding and tending young*. Exact descriptions. Instinctive or acquired? Tested by watching parent birds when undertaking parental duties for the first time under conditions that exclude imitation. Share of parents in feeding or tending. Do cock and hen bring different food to nest? Visits with food per hour and day. Time of day when visits most frequent. Distribution of food among young; which, if any, get most and why. Death of weaker nestlings. Cause. Preparation of food for young, whether by digestion, maceration, or division. Form of food given at different stages of growth. Literature: W. P. Pycraft, *History of Birds*, chap. xiv.

(c) *Methods by which the young, that are fed by their parents, respond to food stimulus*.

Exact descriptions of the bodily movements both of nidicolous nestlings and fledglings (*e.g.* thrush), and nidifugous chicks (*e.g.* waterhen), about to be fed. Are these movements used in the adult stage for other purposes? (*e.g.* quivering of wings of young about to be fed, and of adult hen summoning mate for coition). Where on palate, etc., must there be stimulus by food contact in order to provoke swallowing response? Age at which young cease begging for food. How begging checked by parents.

(d) *Methods of procuring food and drink.* Exact descriptions. How far instinctive, intelligent. For this observe young when first left to their own devices without chance of imitation. Examples: Osprey ("Addenda," p. 619 of this vol.), jay and waterhen (Lloyd Morgan, *Habit and Instinct*, pp. 56-57, 37-38). Observations under this head provide good material for the relationship of behaviour and structure, on which see W. P. Pycraft, *History of Birds*, chap. xxv.

7. **Protection of Young.**—The following will supply heads for observation:—concealment or inaccessibility of nest, aggressive action of parents, protective devices, *e.g.* feigning injury. Note individual variations in parents; also in devotion of male and female respectively. Causes of mortality in young birds. Literature: W. P. Pycraft, *History of Birds*, chap. xv.

8. **Self-protection** (young and adult).—The following will supply heads for observation:—(1) active defence with feet, wings, beak; (2) escape by flight, running, diving; (3) hiding under cover or water; (4) concealing coloration; (5) menacing acts, such as puffing out plumage, hissing, snapping mandibles, etc.; (6) warning utterances; (7) combination for defence; (8) do birds post sentinels? (9) self-protection against extremes of weather, floods. At what age does fear develop? For the question of instinct the young must be studied, possibility of imitation being excluded.

9. **Locomotion.**—Differences in the locomotion of species; flight, hopping, walking or running, climbing, swimming. For instinctive locomotion in young birds see Lloyd Morgan's *Habit and Instinct*, chap. iii.

10. **Social or Solitary Life.**—(a) *Degree of gregariousness* (pair, family, flock) at different times of the year shown by different species.

(b) *Solitary life* (with respect to other members of the same species) normally occurs outside the breeding season; only certain British example is the robin. Map of adjacent areas. See vol. i. pp. 430-435 (robin), and 305 (dipper).

(c) *Mutual aid.* To what extent are communities of birds more than mere aggregations of individuals, that is, to what extent social organisms? All instances of mutual aid carefully noted; also of lack of co-operation. What particular qualities are developed by the social and solitary life respectively? Literature: Lloyd Morgan, *Animal Behaviour*, pp. 225-234; Kropotkin, *Mutual Aid* (Heinemann), stimulating but exaggerated, and with fanciful statements. Should be read in connection with previously quoted work. Better is Espinas, *Les Sociétés Animales* (Baillière et Cie).

(d) *Origin of the bird community or flock.* What causes certain species to unite, others not? Distinguish between flocks formed temporarily for feeding or migration; and those that are permanent (all year) or seasonal, and note all facts bearing on the formation of these, *e.g.* flocking of first broods with or without parents, of families, of smaller flocks into large. Lloyd Morgan, *Animal Behaviour*, pp. 225-234.

(e) *Gregarious roosting.* For problems raised see vol. i. pp. 26-28 (crows), 34-38, 44 (rook); vol. ii. pp. 114-124 (starling).

(f) *Simultaneous flights and concerted movements.* Cause of, when no cause for alarm apparent that can explain the *simultaneity*. Examples: vol. ii. pp. 115-16 (starling), 314 (sand-martin); vol. iii. pp. 463-5 (dunlin).

(g) *Commensalism and parasitism.*—Commensalism is the social relationship between

two species making for the advantage of one or both, and to the detriment of neither. Examples: mistle-thrush and chaffinch (vol. i. pp. 369-70). *Parasitism* is to the advantage of the parasite and detriment of the host. Example: cuckoo (vol. ii. pp. 466-472).

(h) *Imitation*.—See above under "1. General—Classes of Behaviour."

(i) *Intercommunication*.—See above, "Song and Notes."

11. **Migration**.—(a) *General*. What is the impulse that prompts the bird to migrate? Is the impulse to depart and in a given direction instinctive? If so, origin of instinct? How are birds guided to their destination?

(b) *Particular*. Date, hour, place. Number of individuals. Direction of flight, height, speed. Sex of the successive arrivals of the same species. Adult, immature, or birds of year. Wind or weather. Perils. Behaviour on arrival. Behaviour previous to departure. Literature: *Annual Reports of the British Ornithological Club*; Eagle Clarke, *Studies in Migration*, 2 vols. (Gurney and Jackson); T. A. Coward, *Migration of Birds*, 1912 (Cambridge Manuals of Science); Lloyd Morgan, *Habit and Instinct*, pp. 256-261. Latter two best for general questions.

12. **Geographical Distribution**.—Added for sake of completeness, though not falling under the head of behaviour.

(a) *Local List*. Exact descriptions of rare birds noted. Dates. Place seen.

(b) *Local map* showing the distribution of the bird life in a given area all through the year. Also approximate number of resident species, summer visitors, etc. Ring all young in area, and adults if they can be caught. Map the boundaries of nest-areas and feeding-areas of species having such (see vol. i. p. 432). Flight lines. Roosts. Daily movements.

APPARATUS AND METHODS OF PHOTOGRAPHING BIRDS AND THEIR NESTS

[W. FARREN]

So far as the photographic part of the work is concerned, there is no essential difference in photographing birds and their nests and other subjects. I propose, therefore, to devote the greater part of this chapter to hints and methods for overcoming the special difficulties that are presented by the natural shyness of wild birds, and for giving natural representations of their nests.

The one purely photographic point I would emphasize is the importance of giving as full an exposure as possible. In dealing with objects so near to the camera as birds and their nests must be in order to give a large enough image, the contrast of heavy shadows and bright patches of light in juxtaposition is accentuated, and nothing but a full exposure can prevent a spotty, unnatural, and inartistic result. The question of backed, or colour corrected plates, light filters, etc., can be left to the photographic temperament of the individual.

I. SPECIAL APPARATUS

For photographing birds' nests very little in the way of special apparatus is necessary; in fact, good work can be done with any ordinary stand camera, and a cheap single or rectilinear lens. The most important addition is a device for tilting the camera. This may be in the form of a ball-and-socket joint on the tripod head, or preferably, for the sake of rigidity, a tilting-table. It can be obtained from almost any firm of camera manufacturers, or, as the construction is simple, it can be home-made. The simplest form consists of two boards hinged on the front edge. The bottom board is secured to the tripod head with a thumb-screw in the same way that the camera is usually fixed, and another screw passing through the centre of the upper board secures the camera. Slotted struts of brass—or other suitable metal—on each side, pivoted to the edge of the upper board and sliding on milled-headed or thumb-screws on the lower board, allow of its being fixed at any desired angle.

It is frequently necessary to fix the camera very low when photographing nests on the ground. The lowest elevation of commercially manufactured tripods is too high for special requirements; some telescopic metal stands close down short enough, but these are too flimsy. Special low tripods for this purpose are made by more than one firm of camera manufacturers. Those I have seen have the great disadvantage of being non-adjustable as to height. The carrying of two tripods is, moreover, in my opinion, a very poor way of providing for fixing the camera at less than a certain height. A very little ingenuity is necessary to devise a tripod for general use, with a minimum elevation of about two feet. I have one made to my own design, which is four jointed; there is no folding, but all the joints slide one in the other, and it can be fixed at any height from about 18 inches to nearly 6 feet high. (See Figs. 1 and 3, Plate LXXVIII.) A piece of special apparatus often required when photographing nests is a small pocket-mirror for reflecting light on to a nest in a dark situation.



Photo by W. Farren

1. Tent erected at lowest. Tripod the same.
(See pp. 604 and 610)



Photo by W. Farren

2. Tent covered with branches as actually used when photographing a tufted-duck which had its nest a few feet off on the left side. (See p. 611)



Photo by W. Farren

3. Tent erected at full height to accommodate the author standing. Tripod the same.
Tilting board in action. (See pp. 604 and 610)

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For photographing birds, the outfit must be of a more special character to deal successfully with all cases.

The camera should be strongly built, to ensure absolute rigidity; this is an important point, as there is sure to be more severe wear than in ordinary photography. As it is frequently the case that the front of the tent, or some branches, or whatever is used for concealment, will be fastened to the front of the camera, allowing only the lens to project, which makes it undesirable to move the front in order not to disturb the concealing material, it is an advantage to have a camera the back of which racks out for focusing instead of the front, as on the usual form. For this reason, and also for its rigidity, the old square field camera is excellent.

A form of field camera, however, now made by most firms, and known as "triple extension," is good in that both front and back rack out. With such a camera the focus can be roughly adjusted by a moderate extension of the front, the concealing material affixed, and further focusing carried out by racking out the back. This form of camera is additionally useful, owing to the very long extension possible. This is important, as when photographing a near object with a lens of the usual focal length a long extension is necessary. But in order to secure a fair-sized image of a small bird, it is necessary that the lens should be of longer focus than usual, necessitating a corresponding increase of camera extension. The standard sized cameras suitable for this work are half-plate $6\frac{1}{2} \times 4\frac{3}{4}$, 5×4 , and quarter-plate $4\frac{1}{4} \times 3\frac{1}{4}$, and the lenses generally fitted are 8", 6" or 7", and 5" or 6" respectively. For bird work these are too short, and I recommend 10", 8", and 7".

The serious bird photographer will find it convenient to possess a camera of each of these three sizes. For large birds—and indeed for all in such places where weight and size of apparatus is not a serious disadvantage—the half-plate size is the best, as a good sized image of the bird can be obtained without placing the camera too near to the nest, and the size of the plate allows the inclusion of a reasonable amount of surroundings. The 5×4 camera being considerably smaller and lighter, is more portable for less accessible localities, and the quarter-plate is an excellent size for nests. Although in photographing nests, movement owing to wind occasionally makes a short exposure necessary, as a rule it is possible by waiting for a lull when the herbage is still, to give one or two seconds. This with a rapid plate enables the use of a comparatively small lens aperture, small enough to bring all the most conspicuous parts of the surroundings into sharp focus, so that the resulting negative will enlarge satisfactorily to any required size.

For birds, however, the quarter-plate is not large enough to give the best results, and should the beginner wish to confine himself to one camera, the 5×4 size with an 8" lens will be found the most generally useful. I use a 10" lens on my own 5×4 camera and find it very valuable. It should be borne in mind, however, that the depth of focus in the subject photographed decreases with an increase of the focal length of the lens. In other words, if two lenses, one 8" the other 10", and both of an aperture of $f6$, are focused on the same subject, although the 10" will give a larger image, yet a greater depth of the subject will be in sharp focus with the 8" lens. Therefore, if the outfit is to be limited to one lens, 8" will be found the best for general work. As 8" lenses are made to cover sharply a plate $6\frac{1}{2} \times 4\frac{3}{4}$, it follows that when used on a plate 5×4 the covering power of the lens is not taxed to its limits, so that even a moderately good lens is sure to cover the smaller plate. Whatever make of lens is selected, the full aperture should be not less than $f6$, as although the conditions will generally allow of a smaller aperture being employed—and when working at a nest on the ground $f11$ or $f16$, or even smaller may be necessary to secure a desirable depth of focus—yet there are occasions when a bad light, a restless bird, or the depicting of attitudes involving movement, demand a very short exposure; it is then that the value of the large aperture is appreciated.

As a general rule the larger the aperture the more expensive the lens. But it should be

remembered that although an aperture of $f6$, or even $f4.5$ if it can be afforded, may be more or less of a luxurious reserve, yet when it is wanted, it is wanted very badly.

Most, but not all, modern anastigmat lenses are convertible, *i.e.* the front or back combinations can be used separately. Either combination used by itself has a considerably longer focus than the complete lens. The ratio varies in different makes; but as an average one combination of an 8" lens may be 12" and the other 14", so that in one lens there may be a choice of three focal lengths. The value of this is obvious, as although a single combination is not so rapid as the complete lens owing to the fact that not only is the f value of the lens reduced by the increase of focal length, but with most convertible lenses to obtain a sharp focus with a single combination a moderately small stop must be used; yet when for some reason the camera has to be placed farther than usual from a nest, the size of image need not be reduced if light and other conditions allow of sufficient exposure being given to suit the requirements of the single combination.

The two photographs (Figs. 3 and 4, Plate LXXIX.) show clearly the gain in size of image by the use of a single combination of the lens. While the result is similar to that attained by the use of a telephoto lens, the working differs in this important particular—a telephoto lens magnifies, and therefore requires but a short camera extension, while the long focus lens, especially when used on a near object, requires a very long extension. Hence the importance of choosing a camera with the longest extension possible. I frequently require the full 23" extension of my 5 × 4 camera.

SHUTTERS.—For short exposures from $\frac{1}{250}$ of a second down, a focal-plane shutter is best, while it is the only form with which the extremely brief exposures necessary for flying birds can be obtained. In addition, it is more efficient at a given exposure than a shutter working on or near the lens.

For prolonged exposures I have so far found none better than the Thornton-Pickard "Silent-Studio Shutter." This shutter should be fitted behind the lens. It has double roller-blinds lapping in the middle, which open on squeezing a rubber ball and close on its release. With it, it is possible to give exposures from $\frac{1}{2}$ of a second to any required length. The "bulb" action of a between-lens shutter will, of course, do the same, but the opening of these shutters is accompanied with a click that is apt to startle the bird.

To sum up, the outfit recommended above should comprise the following:—

Tripod.—Strong, telescopic if possible; with a range of elevation from 6 feet down to 2 feet.

Tilting-table.

Camera.—5 × 4, triple-extension, racking both ways; reversing and swing back.

Lens.—Convertible; focal length 8"; aperture not less than $f6$.

Shutters.—Focal-plane (the quietest procurable) fitted on back of camera; Silent-Studio or similar make behind lens.

Plate-holders.—Plenty of any kind that will carry the plate securely and are simple to manipulate.

Small pocket-mirror; string; pins.

Although in most bird-work the camera must be used on a stand, yet there are occasions when a hand-camera is not only useful but necessary. The best form is the Reflex, as with it the image can be seen on the focusing screen and the focus adjusted up to the moment of exposure. It is especially suitable for photographing flying birds. There are many good Reflex cameras on the market, but one, called "The Birdland Camera," is made specially for bird-photography. It is very strong, has extra long extension, and can be used equally well as a hand or stand camera. It is fitted with an admirable focal-plane shutter—probably the quietest made. The lens usually supplied is a Goerz anastigmat, and although any other lens

could be substituted, it is doubtful if one better for the purpose could be chosen. This camera would be, of course, more costly than the 5×4 outfit described above, but, if this is no objection, it is the ideal camera for the worker who wishes to confine himself to one camera, as with it he would be prepared for any eventuality in bird-photography. It was made originally by Sanders & Crowhurst, 71 Shaftesbury Avenue, and can now be supplied by H. A. Sanders, 24D-26 Charing Cross Road, London, W.

II. SHUTTER-SPEEDS FOR MOVING BIRDS

So much depends on the conditions of each case, that no hard-and-fast rule is possible for the exposure when photographing moving birds.

It may, however, be taken as a definite rule that the nearer the bird or other moving object photographed, the shorter must be the exposure to avoid blurring. The exposure must be shorter for birds moving across the field of the lens than when moving towards or away.

It is generally possible to choose a time for making an exposure when there is less obvious movement, and it should be remembered that more natural results are obtained by so doing. Of course, such choice is out of the question if the object is to secure photographs showing, for instance, the full range of wing action in flight; but if a natural artistic representation is required, then attitudes clearly perceived by the eye give the best results. Photographs taken during rapid movements are useful for showing phases that the eye does not ordinarily take in, but are not the best for purely pictorial purposes.

In the following table the exposures must be taken as approximate:—

For ground-birds walking to their nests, and for birds feeding young or moving quietly among branches, $\frac{1}{25}$ to $\frac{1}{50}$ of a second.

For the same, if the birds are nervous, and apt to start at the sound of the shutter, $\frac{1}{100}$ to $\frac{1}{200}$ of a second.

For birds alighting on nest, such as terns, which elevate the wings for a brief period as they touch the ground, $\frac{1}{50}$ to $\frac{1}{100}$ of a second.

For birds flying slowly, or at a distance, or approaching or leaving the camera, $\frac{1}{100}$ to $\frac{1}{200}$ of a second.

For birds at a short distance, or flying quickly across the field of the lens, $\frac{1}{200}$ to $\frac{1}{800}$ or $\frac{1}{1000}$ of a second.

III. PHOTOGRAPHING NESTS

Apart from the frequently awkward positions of birds' nests, there is no special difficulty in photographing them. It is, however, quite possible for a photograph, good in other respects, to give an entirely unnatural impression of a nest.

The most frequent fault is to give too large an image of the nest itself and too little of its surroundings. Bereft of colour, and the nature not only of the environment but of the situation, there is often little or nothing to distinguish the nest of one species from that of another. In fact, with many birds identification depends more on the character of the nest and its situation than on the eggs. Every endeavour should therefore be made to include in the picture as much as possible of the surrounding herbage, without unduly dwarfing the nest, and to give some indication of the nature of the situation.

In order to show to advantage the form of the nest and something of its contents, the camera must be placed somewhat higher than the nest, and some device for tilting the camera—preferably a tilting-table on the tripod head—must be adopted. In no wise, however, must the camera be so high and at so acute an angle as to give an unnatural perspective. The eggs

should show if possible, but there is no need—in fact it is undesirable—to show the whole contents of the nest.

There is nothing more unnatural than a photograph of a nest taken with the lens pointing down directly into it. Many photographs showing this fault have been taken of nests built on the ground, chiefly because of the ease with which the tripod can be erected over, or nearly over, the nest, and the camera swung over to the extreme limit of the tilting-table (see Figs. 1 and 2, Plate LXXIX.). Experience will teach the best height above and distance from the nest for the camera, in order to produce a natural representation. It will depend on the focal length of the lens compared with the size of the plate, and also largely on the conditions of each nest. If, before taking a photograph, the subject is carefully studied on the focusing screen from various points, the disappointment of unnatural effects will be saved.

Nests among herbage, in bushes or hedges, can seldom be photographed successfully without a certain amount of clearing away of branches, etc., from one side of the nest.

A nest in a bush that is clearly visible to the eye, may be entirely obscured in a photograph by intervening branches. The eye looks past and ignores these obstacles, the lens cannot do so, but rather makes more of them as being the nearest objects. Clear away just as much as and no more than will ensure a picture of the nest as the eye sees it. In the necessary clearance, and in the time spent over the work, every consideration should be shown for the safety of the nest. Branches should be bent carefully aside, not cut away; and here care is necessary that the interference should not show in the photograph. Always restore the natural cover to a nest before leaving, and obliterate tracks that may lead a possible destroyer to the nest.

Methods of raising the camera in order to deal with nests at a height from the ground, lengthening the legs of the tripod for working in deep water, or for fixing the camera for nests in trees, may be left to the ingenuity of the worker. I may say, however, that I have always preferred the tripod to any device such as a screw or other method of attaching the camera to a branch for photographing nests in trees, because of the greater freedom it gives in the choice of position. The legs can be fastened to convenient branches—with *linen* bandages rather than straps or string, as there is less tendency to slip—and with the help of a tilting-table there is such a range of movement that it is nearly always possible to obtain a good view-point, whereas in fastening the camera directly to a branch, success depends on the presence of a branch in a particular spot.

IV. PHOTOGRAPHING BIRDS

In photographing birds two distinct methods are available—stalking and working in a tent. The relative merits of each have been frequently discussed, but quite unnecessarily, as one is as indispensable as the other, unless we confine ourselves to depicting a certain phase of bird-life. For the majority of birds on and near their nests, a tent or other method of concealment is necessary. There are, however, many sea-birds, more especially those species that nest in large colonies, that can be stalked and photographed without concealment of any kind. Such birds nest, as a rule, more openly and are less timid in the breeding season than solitary species. But apart from sea-birds at or near their nests, there is a wide and useful field for the stalker in the depicting of birds in groups or singly, not necessarily in the nesting season. In the absence of nests one is uncertain as to where to pitch a tent with a probability of birds coming within range. A skilful stalker may succeed in approaching birds and in obtaining photographs showing courtship display, feeding habits, and other interesting phases which do not come within the scope of a worker in a tent. Some workers have attained a great measure of success in this method with a stand camera and a focusing cloth. Personally I prefer the Reflex type of camera, as being less cumbrous and more quickly brought into action. Whichever type of camera is used, a good lens, working sharply at a large aperture, is desirable. It should be of

PLATE LXXIX
ILLUSTRATIONS OF METHODS OF PHOTOGRAPHY



Photo by W. Farren

1. Lapwing's nest wrongly photographed from above.
(See p. 808)



Photo by W. Farren

2. Same taken from correct position.
(See p. 808)



Photo by W. Farren

3. Lesser-whitethroat taken from nearest point possible with
double combination 10" Dallmeyer Stigmatic lens.
(See p. 806)



Photo by W. Farren

4. As 3, but taken with the back combination of the
same lens. (See p. 806)

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fairly long focus, and although telephoto lenses of high power are not very suitable owing to the prolonged exposure necessary, there are at the present day several good ones of moderate power that should be invaluable to the stalker. They are light and compact, and can be used on a Reflex camera.

Let us now turn to methods of photographing birds from a fixed hiding-place. In the first place there must be some degree of certainty of the bird or birds coming to a particular spot on which the camera is trained. Food, either natural or placed for the purpose, will attract many species especially in the winter, when the various species of tits and other birds are easily photographed from a tent or other hiding-place. The Messrs. Kearton have obtained some particularly interesting pictures of birds at a favourite drinking and bathing place. It is a method deserving of far more attention than it has received.

The most effective attraction, however, and the one offering the most certain and perhaps interesting results, is the bird's own nest, either when it contains eggs or young. For all Passerine birds, and others of which the young are helpless and remain in the nest for some time, the best results are obtained after hatching. For others, such as the Waders, whose young leave the nest almost as soon as they are hatched, operations must be conducted before hatching takes place, preferably when incubation is well advanced.

Birds which have young to feed soon become accustomed to the presence of a small tent six to ten feet from their nests, and as most species visit the nest with food fairly frequently, the photographer may in two or three hours expend many plates in depicting the birds during the interesting process of feeding the young, cleaning the nest, etc. In addition to the camera work, observations can be made, and at such close quarters as almost to eliminate chances of error.

The tent may be of almost any form; it should not be larger than is necessary to completely conceal the worker and his apparatus, but there must be room enough to ensure that in manipulating the camera the sides of the tent are not disturbed, as birds are more easily alarmed by a slight movement than by sound. The cover should not be conspicuously coloured or new looking. A dull brownish green is a good serviceable colour, which when weather-worn and faded in patches will conform well with almost any surroundings.

The tree-trunk tent described by Kearton in *Wild Life at Home, How to Study and Photograph It*, is very useful in a garden or other place near home where portability is no great object, but it is too large and cumbersome to carry about on extended expeditions. In addition to this, I doubt whether birds are deceived by an imitation of a tree-trunk or other natural object. They at first regard with suspicion any object added to the immediate environment of their nests, but, so long as it is not startlingly conspicuous, very soon assure themselves of its harmlessness, whatever its form may be.

It is not a difficult matter to devise a light portable framework, with a cover of thin but dense material, capable of being erected in a few minutes. I have one made of an old sketching umbrella, which originally opened out to a diameter of about six feet. As this was considerably larger than necessary, I removed one half of the cane and wire ribs, so that when open the plan was a half-circle of a radius of three feet. I then cut a foot off each outer rib and a few inches off those coming next, converting it into a rough oblong four feet by three. The upright support is four feet long, furnished with a brass socket at the end. This is convenient, as by providing two or three extensions of the upright of various lengths, each shod with an iron spike to go into the ground, I can erect the tent at different heights according to requirements.

An ordinary large sized umbrella would make a good tent frame, but that the stick coming in the centre would be in the way. With half an umbrella as described above, the supporting stick comes against one wall of the tent. Moreover, the oblong shape is rather more economical

of space than a circle, as a small end can face the nest, and there is ample room for the worker to sit or stand behind the camera.

I have another form of frame that makes a circular tent. It has three uprights, each consisting of two parts three feet six inches long. The one a brass tube (A, Fig. 1), the other an iron rod (B, Fig. 1) fitting into it. A thumb-screw (C, Fig. 1) fixes them so that the height

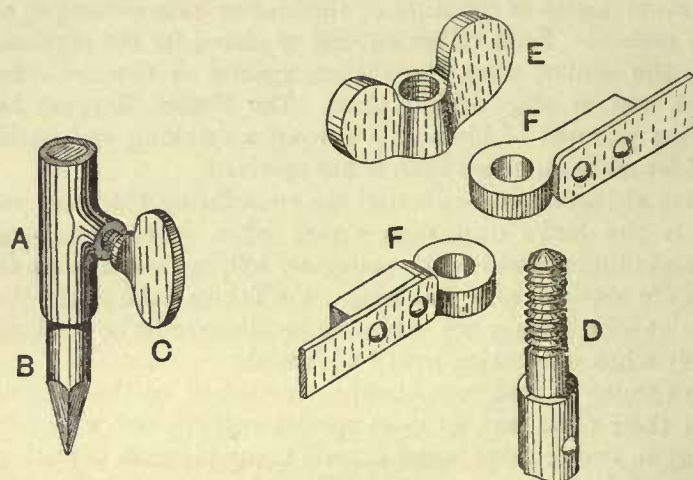


FIG. 1.

of the tent may be anything from three feet six inches to nearly seven feet, according to how much of the iron rod projects from the brass tube. One end of the rod is pointed to go into the ground. Projecting from the top end of each upright is a piece of iron rod (D, Fig. 1) screwed to take a butterfly-nut (E, Fig. 1). The three uprights are connected on top by three lengths of flat spring steel about three feet long. These have at each end a fixed brass loop or ring (F, Fig. 1). Two of these looped ends, one above the other, fit on to the screwed

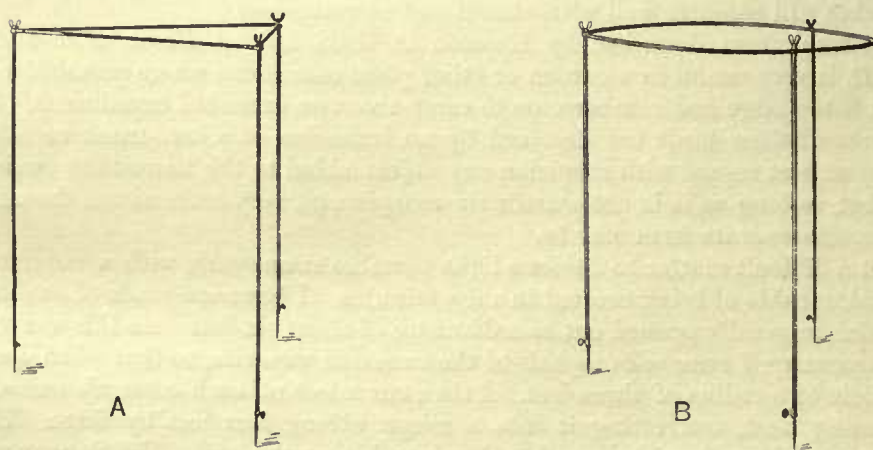


FIG. 2.

end-piece on each upright. Loosely put together the frame forms a triangle (A, Fig. 2), but when the flat steel connecting pieces are sprung outwards in their centres and the butterfly-nuts screwed down holding them firmly as sprung, the whole forms a circle (B, Fig. 2). I describe these two portable tents as guides, but individual ingenuity will suggest many ways of constructing frameworks.

It is advisable, even with the least timid of birds, to place the tent at first three or four yards from the nest, and move it nearer for working purposes—which will probably be six or eight feet, according to the focal length of the lens—after a day or two when the birds have become accustomed to its presence. Most Passerine birds—thrushes, finches, warblers, etc.—with young to feed will come freely to the nest, in the absence of any further preparation. It is, however, a good plan, whatever bird it may be, and, in my opinion, almost vital for success if it is a very timid species, to partially or wholly cover the tent with branches. (See Plato LXXVIII. Fig. 2.)

My usual method when dealing with a timid bird, such as one of the Wader family, is first to stick up some small branches ten or twelve feet from the nest, choosing a position that will ensure a satisfactory lighting on the bird. After an interval of one or two days, I move the branches nearer and add to them, arranging them so that they form a mass about the size that the whole structure will be when the tent is erected. Then allowing another short interval of a day or more to elapse I put up the tent, surrounding it with the branches, which I fasten securely with string to prevent them or the tent-cover from blowing about and frightening the birds.

I prefer doing this if possible the night before I intend working in the tent; in fact, the longer the final structure is in place before the work of observation and photography begins the greater will be the likelihood of success.

At one time I did not use a tent for these timid ground-nesting birds, but made a complete bower of branches and litter. But a tremendous amount of building material is necessary to make the walls sufficiently dense to prevent a bird seeing movement inside. On the other hand, a tent gives absolute obscurity. Nor can the inside of a bower, however neatly constructed, form so clear a chamber for working in as a tent.

Birds are quick to detect the least alteration in the structure, and I have known the addition of the lens showing through the side to keep a nervous bird away for hours. A gamekeeper friend hit on the ingenious device of fixing a bottle in the branches, so that the round glass bottom appeared in the place where it would be replaced by the lens.

Many otherwise good photographs of birds are rendered inartistic by careless focusing. It is not sufficient to focus on the nest and leave the surroundings to chance. As the *depth* of the subject that can be brought into sharp focus is limited, make sure that the surroundings in front, and in the plane of the nest, and as much as possible immediately behind, are sharp. The more distant parts may be out of focus, and frequently aid the artistic effect by giving a soft background to the bird. But all surroundings that are nearer or as near as the bird should be sharp. As the work proceeds and the birds are found to favour certain perching-places, it may be necessary to refocus for these spots. With nests on the ground it is a good plan to mark the *width* of the area covered by the lens with small sticks stuck in the ground—but not so that they come into the picture. They will serve as a guide as to when the bird is in the focused area.

Photographs can be secured without a tent, by concealing the camera near a nest, and operating the shutter from a distant hiding-place by means of string, pneumatic, or electric release. The method has its advantages in such cases where for some reason a tent cannot be used, but the difficulty of seeing when the bird is in the focused area, and the necessity of revealing oneself after each exposure to change plates, and so cause fresh alarm to the bird, are serious limitations, and the method can only be regarded by the serious worker as a reserve.

I always carry a folding stool in my kit. Even when working at a nest in such a position as to need the tent erected at full height, when it will be most convenient to work standing behind the camera, it is a relief to sit and rest occasionally. When working at ground-nesting birds the stool is indispensable. One can sit for hours without the need of any but slight

movement, whereas the personal discomfort of kneeling or sitting on the ground is apt to produce cramped limbs, with a pressing need for movement at critical times.

In conclusion I would urge the following points. Aim at a photographic result that will give as near as possible a natural impression of what you see. Although truthfulness must be the first aim in a scientific photograph, there is no reason against artistic treatment. The man who, by carelessness in an attempt to obtain photographs, causes a bird to desert its eggs, should not be too ready to condemn another for taking eggs for a collection. Therefore do not forget the bird in making your preparations. Time spent in making careful preparation is more than saved in the after work. A companion to close up the tent when you are inside and then walk ostentatiously away—and *keep away*—is a great help, as the most timid bird seldom differentiates between one and two people, and is reassured in the impression that the coast is clear. Make sure before beginning that you will be comfortable. There is no virtue in discomfort, and good work cannot be done with the attention diverted to cramped limbs.

CORRIGENDA AND ADDENDA

VOL. I.

p. 2. **Raven.** In confinement Mr. W. H. St. Quintin has observed that incubation was performed by the female alone.

p. 4. **Hooded-crow.** There is no evidence of the existence of this species in the Balearic Isles, and the form which inhabits the lower Danube valley has been recently separated sub-specifically.

p. 5. As a casual visitor the **Rook** has occurred in Madeira, Iceland, and Greenland, and is not known to breed in the Shetlands. S. E. Brock gives the incubation period as 17 to 18 days, which agrees closely with results obtained from an incubator, and is probably correct.

p. 6. **Rook.** Food. According to an important report issued by the Land Agents Society, there is good evidence to show that grain forms a large percentage of the food of rooks. The words 'occasionally grain' give, therefore, a false impression.

p. 7. The **Jackdaw** which inhabits Algeria is now separated as a local race, but the breeding range of the western form (*C. monedula spermologus*) extends south to Andalusia and N. Morocco. In the British Isles it is scarce in N.W. Scotland, and a rare straggler to the Shetlands, but is common in the Orkneys and has bred in the Outer Hebrides.

p. 8. **Magpie.** Entirely absent from the Outer Hebrides and does not breed in the Orkneys or Shetlands. S. E. Brock gives the incubation period as 17 to 18 days, and fledging as 29 to 30 days.

p. 8. To Plate A, Eggs of the **Crow Family**, add—(Natural size). By H. Grönvold.

p. 8. **Magpie.** Add to the end of the note on Distribution and Migration the following:—'The species is non-migrant.'

Plate 2. (To face page 18.) **Hooded-crow** and **Carrion-crow** for inverse order.

p. 8. **British Jay.** Since this note was written the Irish Jay has been separated under the title of *G. glandarius hibernicus* by Witherby and Hartert, and the occurrence of the Continental Jay, *G. glandarius glandarius* (L.) has been definitely recorded (see *Rare Birds* Section, p. 463).

p. 36. **Rook.** In the last line but one, substitute 'pass' for 'flash.'

Plate V. (To face page 78.) In the legend to the photo of the **Tree-sparrow's** nest, substitute '(see Pl. 10)' for '(see Pl. 16).'

p. 64. **Greenfinch.** Length 6 inches [152 mm.].

p. 69. **Goldfinch.** Line 2 from below, after 'continental race' add *C. carduelis carduelis*.

p. 72. **Lesser Redpoll.** For *Linota flammea rufescens* read *Linota linaria rufescens*.

p. 73. **Mealy Redpoll.** For *Linota flammea flammea* read *L. linaria linaria*.

p. 74. **Twite.** Breeds in the Isle of Man, and has not been proved to nest south of Cheshire, N. Stafford, N. Derby, and Yorkshire (with the sole exception of the Devon colony mentioned), though it is believed to breed in North Wales.

p. 75. **Linnet.** Not known to breed in Shetlands or Outer Hebrides, to which it is only a straggler.

p. 77. **House-sparrow.** A male has been recorded as incubating by J. H. Owen (*British Birds*, vii. p. 52). In the Outer Hebrides it is only known to breed in three localities.

p. 78. **Tree-sparrow.** In Ireland it is now known also to breed in Co. Mayo (1905), Derry (1906), Donegal (1907), and Kildare (1913). Cf. C. J. Patten, *British Birds*, vii. p. 38. In Scotland it is more general on the east side, and scarce on the west. Breeds on St. Kilda.

p. 79. **Crossbill.** As two races are found in the British Isles, trinominals should be used and the

Scotch Crossbill *Loxia curvirostra scotica* Hartert, should be distinguished from the Common or Continental Crossbill, *Loxia curvirostra curvirostra* (Linnæus). For details as to the nesting of the Continental form in the British Isles see *A Hand List of British Birds*, by Hartert, Jourdain, Ticehurst, and Witherby, p. 17, and supplementary notes on the subject in *British Birds*, vol. vi., etc. For crossing of mandibles in young, see *British Birds* (Mag.), iv. 50.

p. 80. **Crossbill.** To the end of the note on Distribution add—The Scotch form may be distinguished by its longer and stronger bill.

p. 81. **Bullfinch.** Here also the resident British form, *Pyrrhula pyrrhula pileata* (MacGillivray), should be treated under a trinomial.

p. 82. **Finches.** Add—For species and sub-species included in the supplementary chapter on *Rare Birds*, see the end of the Classified Notes on the Buntings.

p. 100. For sex display of the **Crossbills** see *British Birds* (Mag.), iv. 48. (J. G. Millais.)

p. 153, note 4. For 'Kelley' read 'Keller.'

p. 157. **Buntings.** Heading. Read Subfamily: *Emberizinae*, for subfamily: *Fringillinae*.

p. 160. The **Yellow-bunting** is not known to nest in some of the Outer Hebrides.

p. 161. **Cirl-bunting.** Has recently been found breeding in Essex, and been observed in Leicester and Derby.

p. 162. **Reed-bunting.** Description, l. 5, 'whitish' for 'white'; l. 7, 'web' for 'wib.'

p. 162. **Cirl-bunting.** Sings to Sept., and, after a pause, all through the winter.—*British Birds* (Mag.), iv. 278 (Alexander).

Plate 30 (to face page 274). On the interleave add—By H. Grönvold, and transfer right to left and vice versa.

p. 165. **Snow-bunting.** In winter it ranges in small numbers south to the Mediterranean; casual in the Canaries, Azores, and N. Africa.

p. 167. **Lapland-bunting.** Breeds on Jan Mayen and Franz Josef Land: in Norway south to the Dovrefjeld. In winter has occurred in N. Italy, and more frequently in Eastern Europe: in Asia to lat. 30° in China.

p. 199. **Skylark.** For *Alauda arvensis* read *Alauda arvensis arvensis*.

p. 200. **Skylark.** Other local races are found in North Africa and East Asia; and the Mediterranean form is found on most of the Mediterranean Islands as well as in South-eastern Europe. The ordinary form breeds sparingly in the Færoes and up to about lat. 70° N. on the Continent. Northern birds winter in the Mediterranean region and North Africa. The Asiatic race (*A. arvensis cinerea*) has now been twice recorded from Scotland (see *Rare Birds* Section).

p. 203. **Shorelark.** The normal winter range extends south to North Germany and South Russia: a few wander to Italy.

p. 209, l. 17 from above. For 'Falconer' read 'Guy Blaine.'

p. 222. **Pied-wagtail.** Occurs on migration in Denmark and Heligoland (frequently), and ranges in winter south to Southern France, Spain, Portugal, and Morocco.

p. 223. **White-wagtail.** Has occurred as a casual in Jan Mayen and S. Greenland, and winters in Tropical Africa, on the west side to Nigeria, and on the east to British East Africa: visiting the Azores occasionally, and the Canaries and Madeira regularly.

p. 225. **Grey-wagtail.** Ranges north to South Sweden in summer, and is a partial migrant, ranging south in winter to Senegambia and British East Africa. The lower figure on Plate IX. represents the nest of this species and not the Yellow-wagtail.

p. 226. **Yellow-wagtail.** Usually a 'black superciliary stripe.'

p. 227. **Yellow-wagtail.** In Scotland a few pairs breed on the east side north to Aberdeen, but not beyond Clyde area on the west. It also nests apparently in W. Holland, and ranges in winter to Africa south to the Congo.

p. 228. **Blueheaded-wagtail.** The northern breeding limit is middle Scandinavia, and the Cantabrian Mountains and Pyrenees are the southern limit in Spain, while it also breeds in N. Italy and as far as the Danube and Save. Its winter quarters lie in Tropical Africa, occasionally ranging to the Cape.

p. 230. **Tree-pipit.** Recently recorded from Tuskar Light, Co. Wexford, on autumn migration by Professor C. J. Patten. Also breeds in Temperate Asia, east to the Yenisei and south to the Tian

Shan, and perhaps the W. Himalayas, being replaced further east by an allied race. On migration ranges to Tropical and Southern Africa and N.W. India.

p. 231. **Meadow-pipit.** The winter migration range extends to the Mediterranean region, North Africa and Palestine. Casual in Greenland.

p. 233. **Tawny-pipit.** Winters in Tropical Africa, south to Senegambia and the White Nile, and in Asia to Arabia and North-western India.

p. 234. **Richard's-pipit.** Winters in Tropical Asia, chiefly from India eastward to China. Has occurred about 80 times in the British Isles. In Scotland has occurred in Kirkeudbright, and in Ireland in Co. Dublin in 1911.

p. 236. **Alpine-pipit.** Also breeds in Corsica. In winter these birds descend to lower levels and are found in the great plains of Germany and Hungary, ranging south to the Mediterranean and the coast of N.W. Africa.

p. 237. **Rock-pipit.** According to Collett also breeds on the Norwegian coast. In winter ranges south to the coast of Spain.

Plate 30 (to face p. 274). On the interleave add—By H. Grönvold, and transfer right to left and vice versa.

p. 279. **Tree-creeper.** The specimen from Fair Island is now known to belong to the Scandinavian or Northern race (see *Rare Birds* Section).

p. 287. **Wren.** In paragraph 2 (Distribution) delete 'Norwegian' and add 'Mediterranean and North-West African.'

p. 297. **Dipper.** For *Cinclus cinclus britannicus* (Linnæus) read *Cinclus cinclus britannicus* (Tschusi). Length 7 inches [178 mm].

p. 298. The **Dipper** is only a very rare straggler to the Orkneys.

p. 320. The **Song-thrush** of the Outer Hebrides has been described by Mr. Eagle Clarke as a subspecific form under the name of *Turdus musicus hebridensis* (*Scottish Naturalist*, 1913, p. 53, pl. 1). See supplementary chapter on *Rare Birds*, p. 341. The British race, *T. musicus clarki*, according to Baron Snouckaert van Schauburg, also inhabits Holland.

p. 322. The **Continental Song-thrush** has now been identified from Dorset, Hants, Suffolk, Norfolk, Lincoln, Yorkshire, 'Forth' (Isle of May), 'Moray,' Fair Island, and Mull of Galloway.

p. 323. **Redwing.** Casual in Greenland and Spitsbergen, and in winter visits the Mediterranean region, and has been recorded from the Canaries, Madeira, and Algeria, as well as east to Persia and North-west India.

p. 326. **Fieldfare.** Winters in Southern Europe as well as the British Isles, ranging south to the Canaries, North-west Africa, Egypt, Palestine, Persia, and N.W. India.

p. 328. **Blackbird.** Other local races are found in Western Asia east to the Himalayas and Mongolia.

p. 329. **Ring-ouzel.** As two races of this species have now been recorded from the British Isles, this should be called *Turdus torquatus torquatus* (Linnæus). In winter it ranges through Europe to the Mediterranean, south to N.W. Africa. Description, l. 5. For 'browner' read 'brown.'

p. 331. The correct generic name for the **Wheatears** has recently been shown to be *Enanthe*, so that the common Wheatear should be called *Enanthe enanthe enanthe* (Linnæus). Recently the S. Spanish birds have been separated, and a distinct local race inhabits the mountain ranges of N.W. Africa. The ordinary race ranges south in winter to Tropical Africa. On p. 333 for *Saxicola enanthe leucorhoa* read *Enanthe æ. leucorhoa* (Gmelin).

p. 331. **Wheatear.** Length 6 inches [152 mm.].

p. 333. **Wheatear.** Size of eggs .81 × .61.

p. 333. The generic name *Saxicola* supersedes *Pratincola* for the **Chats**. For *Pratincola rubetra* (Linnæus) read *Saxicola rubetra* (L.). The Whinchat (p. 335) is only known to breed in Ireland in the northern half of the country, on the east side south to Wicklow and sporadically in Clare and Cork. Other races are found in W. Asia and perhaps N.W. Africa. The winter quarters are in Tropical Africa.

p. 338. **Redstart.** The winter quarters of this species lie in West and N.E. Africa south to the White Nile.

p. 340. **Black-redstart.** Absent from the Balkan Peninsula south of Bulgaria. Winters in Southern Europe and Northern Africa from Morocco to Nubia.

p. 341. **Redspotted-bluethroat.** Length 6 inches [152 mm.].

p. 342. **Redspotted-bluethroat.** On migration, besides visiting our east coasts, this race passes Heligoland, the Low Countries, France, apparently North-west Germany and Spain, apparently wintering in West Africa.

p. 343. **British Redbreast.** A few breed in Lewis and North Uist. The Continental Redbreast is a regular migrant to the northern portion of its breeding range, wintering in the Mediterranean region south to the oases of the Sahara.

p. 345. **Nightingale.** For *Luscinia megarhynchos* read *L. megarhyncha*. (Other local races of this species are found in Corsica and South-western Asia.) The winter quarters of the Nightingale lie in Tropical Africa south of the Sahara, from the Gold Coast to Abyssinia. Description, l. 2, read 'tail' for 'tone'; l. 8, omit 'juvenile.'

p. 345. **Nightingale.** Line 7, 'tail' for 'tone'; l. 13, omit 'fledgling.'

p. 347. **Dusky-thrush.** For *Turdus dubius* read *T. fuscatus* (Pallas).

VOL. II.

p. 2. **Whitethroat.** Bred in Lewis in 1881. Some visit the Canaries.

p. 4. **Lesser Whitethroat.** There are three records of this species on migration from the Irish coast (Counties Kerry, Donegal, and Dublin).

p. 9. **Dartford-warbler.** One specimen was caught at the Tuskar Light, Co. Wexford, Ireland, Oct. 27, 1912.

p. 10. **British Goldcrest.** Said to have bred twice in the Orkneys, and also in Stornoway in 1906.

p. 14. **Chiffchaff.** In Scotland it has bred on Arran and Bute. The statement that it is fairly common near Loch Maree is quoted in brackets by J. A. Harvie-Brown.

p. 17. **Arctic Willow-warbler.** Also has occurred on migration in Holland.

p. 20. **Reed-warbler.** Now known to breed in N. Algeria. On migration has been obtained on Fair Island (Sept. 1908), on the Orkneys (four times), while there are three undoubted records from Ireland (*Irish Nat.*, 1912, p. 50).

p. 22. **Marsh-warbler.** Recorded on migration from St. Kilda (Sept. 6, 1910), and Fair Island (Sept. 24, 1906). According to Mr. H. E. Howard the male accompanies the hen when building but does little work. Incubation period 12 days, the sexes relieving one another every half-hour (H. E. Howard).

p. 26. **Aquatic-warbler.** One obtained in the Isle of Wight on August 17, 1912.

p. 27. **Grasshopper-warbler.** Though absent from the Outer Hebrides, the mainland of Scotland north of the Moray Firth, and the Orkneys, it has occurred twice on Fair Island on spring migration.

p. 34. Plate 48. **Blackcap.** Add to title : and female (in the background).

p. 96. **British Hedge-sparrow.** Common near Stornoway in Lewis (Outer Hebrides).

p. 105. **Starling.** Visits Madeira and the Canaries on passage, and casual in Spitsbergen, Iceland, and Greenland.

p. 145, l. 11 from above. For 'pp. 78, 79,' read '147, 148'; l. 2 from below, for 'the species' read 'two species.'

p. 156. **Waxwing.** For *Bombicilla garrulus* read *Ampelis garrulus* (Linnæus).

p. 176. **British Coal-tit.** From the paragraph on the distribution delete the reference to Ireland, which applies to the Irish Coal-tit.

p. 179, l. 6 from below. For 'Also record' read 'Also recorded'; l. 8 from above, after 'Ireland' add 'except where introduced.'

p. 180. **British Willow-tit.** To list of counties where found add: Devon, Yorks, Lancashire, Derby, Salop, Worcester, Hereford, and Brecon.

p. 184. Two continental races of **Crested-tit** have now been definitely identified, *P. cristatus cristatus* (Linnæus) and *P. cristatus mitratus* (Brehm) (see *Rare Birds* Section).

- p. 214. **Nuthatch.** A record from Co. Dublin in 1911 was probably due to an introduced specimen.
- p. 223. **Bearded-tit.** Also breeds at one locality in Devonshire.
- p. 238. **Redbacked-shrike.** No authentic record of nesting from Scotland.
- p. 251. **Great Grey-shrike.** The Southern Grey-shrike has now been definitely added to the British Fauna, although the specimen here referred to proved not to belong to the race (see *Rare Birds* Section).
- p. 261. **Spotted-flycatcher.** Description, l. 2, read 'marked' for 'marled.'
- p. 264. **Pied-flycatcher.** Breeds in small numbers in Devon.
- p. 318. **Green-woodpecker.** Description, l. 3; omit 'The sexes are alike.'
- p. 319. **Green-woodpecker.** The British form of Green-woodpecker, which is confined as a breeding species to England and Wales, has been separated recently by Dr. Hartert under the name of *Picus viridis pluvius* (Hart.).
- p. 320. For *Dendrocopos major anglicus* read *Dryobates m. anglicus*. Also substitute *Dryobates* on p. 322 and 323.
- p. 329, l. 2 from below. After 'J. E. Harting' insert 'mentions that a young collector.'
- p. 379. **Owls.** The food of the young is similar to that of the old birds, and both parents help to feed the young. Footnote 2. Read 'tawny-owl' for 'barn-owl.'
- p. 383. The incubation period of the Tawny-owl is given by Dettmers as 27 to 29 days.
- p. 390. The Little-owl is now known to breed also in Lincoln, Berks, Essex, Middlesex, Norfolk, Warwick, and Notts.
- p. 422. **Roller.** Casual in Norway, the Færoes and Canaries.
- p. 435. **Hoopoe.** The young are fed on a similar diet to the old birds by both parents.
- p. 446. **Kingfisher.** Base of mandible red in the female. Food of young small fish and crustacea, administered by both parents.
- p. 461. **Great Spotted-cuckoo.** For *Coccyzus* read *Clamator*.
- p. 490. **Cuckoo.** To list of records of rarer foster parents add:
 Starling. Recorded by H. J. Selby (*Field*, June 14, 1913).†
 House-sparrow. Add: A. T. Daniel, *Rep. North Staff. Field Club*, 1900-01, p. 47.
 Skylark. Add: H. Bentham (*British Birds*, vi., p. 278)†; C. V. Stoney (*l.c.*, p. 342).
 Rock-pipit. Add: F. C. R. Jourdain (*British Birds*, vi., p. 156); C. Kirk (*Scott. Nat.*, 1912, p. 235)†; H. Noble and H. Terry (*British Birds*, vi., p. 223).
 Whinchat. Cf. J. Steele Elliott (*Birds of Bedford*, p. 126).†
 Marsh-warbler. Add: R. P. Wild (*British Birds*, vi., p. 155).
 Grasshopper-warbler. Add: C. E. Pearson and A. Tomlinson (in litt.).
 Spotted-flycatcher. Add: T. Ratcliffe (*C. Life*, July 20, 1912).†
 (The Blue-tit has also been recorded as a fosterer, but I have not the original reference.)
- For instances of early laying see *British Birds*, vi., pp. 18, 90, 122.
- p. 501. **Woodpigeon.** The food and feeding of the young is described on pages 508-509.
- p. 503. **Stock-dove.** The food and feeding of the young is described on pages 508-509.
- p. 504. **Rock-dove.** The food and feeding of the young is described on pages 501-509.
- p. 505. The generic name for the **Turtle-doves** should strictly be *Streptopelia* Bonaparte.
- p. 506. **Turtle-dove.** The food and feeding of the young is described on pages 501-509.
- p. 527. **Pallas' Sandgrouse.** Omit the reference to 'Northumberland' in 1872 (see G. Bolam, *Birds of Northumberland*, etc., p. 443).

VOL. III.

- p. 4. **Guillemot.** Line 2 from below, for '3·04' read '3·17' and for '77·37' read '80·73.'
- p. 7. **Black-guillemot.** Description, l. 4, omit 'male.'
- p. 10. **Puffin.** Description, for sides of face 'smoke-brown' read 'greyish white'; for rest of upper parts 'black' read 'slaty black'; for at the gape is a rosette-like wattle of 'red' read 'orange-yellow.'

- p. 15. **Guillemot**. Line 23 from above, for 'N. Ronay' read 'N. Rona.'
- p. 59. **Common-tern**. Also breeds in Madeira.
- p. 62. **Arctic-tern**. Whether this species still breeds in the Scillies is uncertain, though it is clear that a great diminution has taken place in the numbers nesting there.
- p. 67. **Sandwich-tern**. The Walney breeding-place was occupied in 1911 and 1912: a nest was found at Orford on the Suffolk coast in 1906, and an egg found in the Clyde estuary in 1912.
- p. 70. **Little-tern**. Line 4 from above. One pair bred in Northumberland in 1911 and two pairs in 1912.
- p. 75. **Black-tern**. Line 15 from above, after 'but' add 'any intruder.'
- p. 115. **Blackheaded-gull**. Description, ll. 14, 18. For 'black' read 'dark brown.'
- p. 123. Probably the **Herring-gulls** which breed on the Finland coast, Lake Ladoga and the Russian Baltic Provinces belong to the Yellow-legged race, *L. argentatus cachinnans* (S. A. Buturlin).
- p. 125. **Lesser Blackbacked-gull**. Dr. P. R. Lowe has recently distinguished the race which breeds in the British Isles under the name of *L. fuscus britannicus*, but Mr. T. Iredale maintains that Reinhardt's name *Larus affinis* really applies to the British and not the N. Asiatic form, in which case the British Lesser-blackback would stand as *L. fuscus affinis* (Reinhardt). As the Scandinavian race (*L. fuscus fuscus* L.) has now been recorded from Suffolk, trinominals should be used here (see *Rare Birds* Section, p. 513).
- p. 127, l. 10 from above. For *L. fuscus affinis* read *L. fuscus antelius* Iredale (*affinis* auct.).
- Egg Plate H. Of the four figures given of eggs of the **Roseate-tern**, the second from the left, though taken from a specimen in the British Museum and formerly in the Saunders collection, has none of the characters of this species and is evidently that of some other species.
- p. 195. **Great-skua**. If this species is included in the same genus as the other skuas, its name will stand as *Stercorarius skua* (Brünnich).
- p. 196. **Great-skua**. In Iceland most colonies are on the low-lying plains of volcanic sand by the mouths of the rivers.
- p. 210. **Great-skua**. The attack seems always to be made up-wind (see F. C. R. Jourdain, *British Birds*, vi., p. 245).
- p. 230. **Stone-curlew**. If the Australian *Burhinus* be included in the same genus as *Edicnemus*, the former as the older name will supersede the latter.
- p. 264. It has now been shown by Dr. Koenig that the **Rednecked-phalarope** also occurs in small numbers in Spitsbergen.
- p. 325. **Lapwing**. Length 13 inches [330 mm.].
- p. 387. **Oyster-catcher**. Description, l. 13 from below for 'appears' read 'disappears.'
- p. 390. **Turnstone**, ll. 1, 25. Colour of legs yellow.
- p. 421. Hartert (*Hand List of British Birds*, p. 173) has adopted the generic name *Erolia* for the **Dunlins**, **Stints**, etc., as being the oldest available name.
- p. 429. **Purple-sandpiper**, l. 12. For 'legs' read 'wings'; l. 13, p. 428, for 'fore-edge' read 'free-edge.'
- p. 438. The generic name *Totanus*, which has for many years been used for the **Sandpipers**, etc., should by strict priority be discarded in favour of *Tringa* (see Hartert, *Hand List*, etc., p. 179).
- p. 450. **Bartailed-godwit**. Description, l. 3. Read 'the sexes are almost alike.'
- p. 451. **Blacktailed-godwit**. Description, l. 2, omit 'much.'
- p. 455. **Curlew**. Also casual in Iceland.
- p. 459, lines 15 and 16 from above. For 'American Stilt' and 'Temminck's Stilt' read '**American Stint**' and '**Temminck's Stint**.'

VOL. IV.

- p. 3. The British race of **Black-grouse** has been recently separated by Messrs. Witherby and Lönnberg under the name of *Lyrurus tetrix britannicus* (*British Birds*, vi., p. 270). This race is confined to Great Britain.
- p. 13, l. 11 from below. For 'nineteenth' read 'eighteenth.'

- p. 58, line 12 from below. For *Perdix cinerea* read *Perdix perdix* (also on p. 63).
- p. 102. **Harriers.** Line 2 from above, for 'wiles' read 'writer.'
- p. 130. **Osprey.** Instinctive diving for food by young. Two taken from nest, and reared by hand, started to fish as soon as able to fly, and by methods similar to those of the old, but the execution was at first clumsy (*American Zoological Society Bulletin*, No. 11, 1903, p. 120, Baynes). Similar fact recorded of a young osprey brought as a nestling in the New York Zoological Park (*Scribner's Magazine*, xli., 1907, p. 704, C. W. Beebe). Both quoted in Clinton Abbot's *Home Life of the Osprey*, 53.
- p. 140. **Kestrel.** Length $12\frac{1}{2}$ inches [320 mm.]
- p. 146. **Peregrine-falcon.** Line 9 from above, for 'Cheshire' read 'the Seillies.'
- p. 173. **Whooper.** From observations made on a captive bird at Amsterdam, incubation was performed by the female alone and lasted 31 days, but three days elapsed between the laying of the last egg and the beginning of incubation (Dr. Kerbert).
- p. 182. For notes on the 'song' of **Bewick-swan** see an interesting letter by H. W. Robinson in *British Birds*, vi., p. 280.
- p. 264. **The Diving Ducks.** The first volume of Mr. J. G. Millais' splendid work on the diving ducks has now appeared and contains figures and descriptions of the courting habits and actions of several species of these birds.
- p. 275. **Goldeneye.** For further descriptions of courting habits see Millais' *Diving-ducks*, p. 92 and plate.
- p. 278. **Longtailed-duck.** See *tom. cit.*, p. 124 and plate.
- p. 316. **Spoonbill.** Footnote: for 'there' read 'in S. Spain.'
- p. 330. **Bittern.** Breeding also took place in Norfolk in 1912 (*Zool.*, 1913, p. 175).
- p. 352. **Cormorant.** Description, line 4, after blue-black metallic gloss add, 'the white band across the throat'; 3rd line from bottom of par. delete 'frequently.'
- p. 388. **Fulmar.** Breeding has recently been recorded from the Great Skellig, Co. Kerry, Ireland, in 1913 (R. M. Barrington, *British Birds*, vii., p. 56), as well as from Tory Island, Co. Donegal (R. J. Ussher, *Irish Nat.*, 1913, p. 164).
- p. 364. **Gannet.** Description, ll. 13-14, read 'is said to be immature.'
- Duck-down, Plate U (Section XI.). H. Grönvold.
- Section XI. Headlines on pages 340, 342, 344, 346, 348, and 350 should read 'Bitterns.'

RARE BIRDS SECTION.

- p. 481. **Alpine Ring-ouzel.** Another has recently been recorded from Sussex by Mr. J. B. Nichols (March 29, 1913).
- p. 484. **Asiatic Desert Wheatear.** A second specimen has been obtained in Kent, May 21, 1913.

LIST OF WORKS CONSULTED

[By F. C. R. JOURDAIN and F. B. KIRKMAN]

I. BIBLIOGRAPHIES.

- Arrigoni degli Oddi, *Atlante Ornitologico* (1902).
Bibliotheca Zoologica (1700-1880).
C. G. Giebel, *Thesaurus Ornithologicæ*. 3 vols. (1872-77).
E. Coues, *Ornith. Bibliography*, 4th instalment. *United States National Museum Proceedings*, ii., 359-482 (1880). List of British Ornithological Works up to 1880.
Zoologist, 1890 (249-267). List by Miller Christy of British Local Faunas.
Catalogue of the Library of the Zoological Society. 5th Edit. (1902).
Zoological Record. Aves. (1864-), a most valuable list of books and articles.
Naturalist (1884-1905). Contains bibliographies for the Northern Counties and Man by W. D. Roebuck. This bibliography was first published in the *Naturalist* for 1885, and was still in progress in 1898, but had ceased in 1905. [F. C. R. J.]
British Museum Catalogue of Books,
British Museum Subject Index (G. K. Fortescue) (1881-1905).
Dictionary of Birds, by A. Newton and H. Gadow (1893-1896). Introduction. [F. B. K.]

II. GENERAL SYSTEMATIC WORKS (Descriptions, Distribution, Habits).

(a) *West Palæarctic.*

- J. Gould, *The Birds of Europe*. 5 vols. (1832-37).
C. R. Bree, *A History of the Birds of Europe not observed in the British Isles*. 5 vols. (1859-63). 2nd Edit. 5 vols. (1875-76).
H. E. Dresser and R. B. Sharpe, *The Birds of Europe*. 8 vols. (1871-81). 1 vol. Supplement (1895-96). (A very valuable storehouse of information, though now somewhat out of date.)
J. Backhouse, *A Handbook of European Birds* (1890). (Brief descriptions only.)
J. A. and J. F. Naumann, *Naturgeschichte der Vögel Mitteleuropas*. Revised edition under editorship of Dr. Carl R. Hennicke. 12 vols. (1887-95). By far the most valuable foreign work of its kind, but with respect to Habits is now somewhat out of date.
E. Hartert, *Die Vögel der Paläarktischen Fauna* (in process of publication) (1903-). Contains accurate descriptions of all known local races and brief notes on life histories.
C. G. Friderich, *Naturgeschichte der Deutschen Vögel*, etc. Ed. v. Edited and revised by A. Bau (1905). [F. C. R. J.]

(b) *East Palæarctic Region.*

- J. Gould, *The Birds of Asia*. 7 vols. (1850-83). No comprehensive works on this enormous region have been published of recent years except Dr. Hartert's *Die Vögel der Paläarktischen Fauna*, already

mentioned, but the principal works on the Ornithology of Siberia, Persia, Afghanistan, and Japan are indicated in the List of Local Faunas (p. 630).

For the Circumpolar Region see H. Schalow's *Die Vögel des Arktis* (1904).

The first part of a new work in Russian on the Fauna of the Russian Empire (*Oiseaux*, by V. L. Bianchi) was issued in 1911.

Information on many species which occur in Northern Asia will also be found in *The Fauna of British India: Birds*, vols. i. and ii., by E. W. Oates; iii. and iv., by W. T. Blanford; *The Nests and Eggs of Indian Birds*, 3 vols., by A. O. Hume and E. W. Oates (1889-90); *A Handbook to the Birds of British Burmah*, 2 vols., E. W. Oates (1883); *Les Oiseaux de la Chine*, by A. David and E. Oustalet (1877); *Catalogues of the Birds of China*, by R. Swinhoe, published in the *Proceedings of the Zool. Soc. of London* for 1863 and 1871. [F. C. R. J.]

(c) *Nearctic Region.*

The following important general works have been consulted in addition to the older works of J. J. Audubon, A. Wilson, Swainson and Richardson, etc.:

S. F. Baird, J. Cassin, and G. N. Lawrence, *The Birds of North America*. 2 vols. (1860).

S. F. Baird, T. M. Brewer, and R. Ridgway, *A History of North American Birds*. 3 vols. (1874-75).

The Water-Birds of North America (1884). 2 vols.

E. Cones, *Key to North American Birds* (1872). Revised edition (1884).

C. Bendire, *Life Histories of North American Birds*. 2 vols. (unfinished). (1892 and 1895.)

R. Ridgway, *A Manual of North American Birds* (1887). 2nd edit. (1896).

The Birds of North and Middle America. 5 vols. issued (in progress). (1901-)

J. Macoun, *Catalogue of Canadian Birds* (1900). 2nd edit. (1909). [F. C. R. J.]

(d) *British.*

G. Montagu, *Dictionary of British Birds* (1802). Supplement (1813).

W. Macgillivray, *A History of British Birds*. 5 vols. (1837-52).

J. Gould, *The Birds of Great Britain*. 5 vols. (1862-73).

W. Yarrell, *A History of British Birds*. 4th edition revised by A. Newton and H. Saunders. 4 vols. (1871-85).

H. Seebohm, *A History of British Birds*. 6 vols. (1883-1886).

H. Saunders, *Manual of British Birds*. 2nd edit. (1899).

C. J. Patten, *Aquatic Birds of Great Britain and Ireland* (1906).

E. Hartert, F. C. R. Jourdain, N. F. Ticehurst, and H. F. Witherby, *A Handlist of British Birds* (1912).

E. Booth, *Rough Notes*. See below (IV). [F. B. K.]

III. MONOGRAPHS. (Habits.)

J. G. Millais, *Game Birds and Shooting Sketches* (1892).

The Natural History of the British Surface-feeding Ducks (1902).

The Natural History of British Game Birds (1909).

British Diving Ducks. 2 vols. (1913).

H. E. Howard, *The British Warblers: a History with problems of their lives* (1907-).

S. Alphéraky, *The Geese of Europe and Asia* (1905).

Th. Pleske, *Ornithographia Rossica*, vol. ii. pts. i.-v. (Sylviidae) [all published] (1889).

A. B. Meyer, *Unser Auer-, Rackel-, und Birkwild* (1887).

H. Seebohm, *A Monograph of the Turdidae* (completed by R. B. Sharpe). 2 vols. (1885-1894).

R. B. Sharpe and C. W. Wyatt, *A Monograph of the Hirundinidae*. 2 vols. (1885-1894).

- D. G. Elliot, *A Monograph of the Tetraonidae* (1864-5).
 S. Grieve, *The Great Auk or Garefowl* (1885).
 B. R. Morris, *British Game Birds and Wildfowl* (1855); 5th edit. 2 vols. (1897).
 E. A. Wilson and others, *The Grouse in Health and Disease*, Final Report. 2 vols (1911).

[Monographs on Families which include only one British species, or deal solely with distribution, are not included in the above list.] [F. C. R. J.]

IV. GENERAL FIELD ORNITHOLOGY.

(Only the more important are given.)

- Gilbert White, *Natural History of Selborne* (1789, etc.).
 W. H. Hudson, *Birds of London* (1898).
 Birds and Man (1901).
 Nature in Downland (1900).
 Afoot in England (1909).
 Hampshire Days (1906).
 Land's End (1908).
 Birds in a Village (1893).
 E. Selous, *Bird Watching* (1901).
 Bird Watcher in the Shetlands (1905).
 Bird Life Glimpses (1905).
 J. L. Knapp, *Journal of a Naturalist* (1829).
 E. Booth, *Rough Notes on the Birds observed during Twenty Years* (1881-7).
 A. Chapman, *Bird Life of the Borders*. (2nd edit., 1907.)
 and W. J. Buck, *Wild Spain* (1893).
 Unexplored Spain (1910).
 Granville Sharpe, *Birds in the Garden* (1902).
 A. Trevor Battye, *Icebound on Kolguev* (1895).
 J. M. Boraston, *Birds by Land and Sea* (1905).
 Nature Tones and Undertones (1905).
 W. Warde Fowler, *A Year with the Birds* (1886).
 Summer Studies of Birds and Books (1895).
 Ch. Waterton, *Essays in Natural History* (1838-57; 1871).
 R. and C. Kearton, *Wild Life at Home* (1898).
 Wild Nature's Ways (1903).
 With Nature and a Camera (1897).
 J. S. v. Petényi, *Ornithologische Fragmente* (1905).
 A. H. Patterson, *Wild Life in a Norfolk Estuary* (1907).
 Notes of an East Coast Naturalist (1904).
 Nature in Eastern Norfolk (1905).
 R. B. Lodge, *Pictures of Bird Life* (1903).
 Bird Hunting through Wild Europe (1908).
 Seton Gordon, *Birds of Loch and Mountain* (1907).
 Sir R. Payne Gallwey, *The Fowler in Ireland* (1882).
 E. L. Turner and P. H. Bahr, *Home Life of Marsh Birds* (1907).
 H. J. Pearson, *Beyond Petsora Eastward* (1899).
 Three Summers in Russian Lapland (1904).
 C. St. John, *Short Sketches of the Wild Sports and Natural History of the Highlands* (1846, etc.).
 Natural History and Sport in Moray (1863).
 W. Verner, *My Life among Wild Birds in Spain* (1909).

- Oswin Lee, *British Birds in their Nesting Haunts* (1896-1900).
 H. B. Macpherson, *The Home Life of a Golden Eagle* (1910).
 Clinton G. Abbott, *Home Life of the Osprey* (1911).
 Bentley Beetham, *The Home Life of the Spoonbill, the Stork, and some Herons* (1910).
 J. G. Millais, *The Wildfowler in Scotland* (1901).
 W. Bickerton, *The Home Life of the Terns* (1912).
 H. Seebohm, *Siberia in Europe* (1880).
 Siberia in Asia (1882).
 J. A. Harvie-Brown, *Travels of a Naturalist* (1905).
 A. E. Knox, *Ornith. Rambles in Sussex* (1849).
 Autumns on the Spey (1872). [F. B. K.]

V. ANIMAL BEHAVIOUR.

See the supplementary chapter on the *Study of Bird Behaviour*. [F. B. K.]

VI. LOCAL FAUNAS.

(a) West Palæarctic Region—Europe.

ICELAND.

(Some of the older works on Icelandic ornithology, though out of date as regards distribution, contain valuable material for the study of life-history and habits. Among these may be mentioned Faber's *Prodromus der isländischen Ornithologie*, 1822, and *Über das Leben der hochnordischen Vögel*, 1826.)

1901. H. H. Slater, *Manual of the Birds of Iceland*. (A useful little handbook and on the whole dependable.)

1905. B. Hantzsch, *Beitrag zur Kenntnis der Vogelwelt Inseln*. (The most complete work on the ornithology of the island.)

(Useful information may also be found in the *Ibis* for 1885, 1886, 1895, 1911, and the *Zoologist*, 1864, 1886, 1887, 1901; *Naumannia*, 1857; *Ornis*, 1886, 1887, 1895-6, 1897; *Orn. Monatsschrift*, 1896, 1902, and *Br. Birds*, vi., etc.)

FÆROES.

1862. H. C. Müller, *Faerøernes Fugle fauna m. Bemaerk. om Fugle fangsten*. The only work on the ornithology of the group. A translation into German appeared in the *J. F. Orn.* for 1869, and Colonel H. W. Feilden published a series of papers in the *Zoologist* for 1872, which were founded on Müller's work. Cf. also *Zoologist*, 1906 (P. F. Bunyard).

SPITSBERGEN.

1911. A. Koenig, *Avifauna Spitzbergensis*. This magnificent work contains a special part (edited by Dr. O. Le Roi) in which the literature and the bird life of the group is treated in masterly style and in the fullest detail.

(Numerous papers of less importance have been published in the *Ibis* and *J. F. Orn.*)

JAN MAYEN.

1890. The *Zoologist*, pp. 1-16 and 41-51, contains an annotated translation of Fischer and v. Pelzeln, *Vögel von Jan Mayen* (1886).

NORWAY AND SWEDEN.

The older works of M. and W. von Wright, *Svenska Foglar* (1828-38); Nilsson, *Skandinavisk Fauna* (1858), and Collin, *Skandinaviens Fugle* (1875-77) are now much out of date, and the most useful modern work is Dr. C. A. Westerlunds *Skandinaviska Foglarnes Fortplantningshistoria* (1878-1904); with Appendix (1905) by Westerlund and Ottosson.

(Professor Collett published many interesting papers on Norwegian ornithology. His *Bird Life in Arctic Norway* appeared in English, translated by A. H. Cocks (1894), and *Remarks on the Ornithology of Northern Norway* (1872) is also in English. For those who only read English, H. W. Wheelwright's *A Spring and Summer in Lapland* (1864), and *Ten Years in Sweden* (1865), as well as A. Chapman's *Wild Norway* (1897), and L. Lloyd's *Gamebirds and Wildfowl of Sweden and Norway* (1867), all contain notes on bird life.

DENMARK.

The second edition of Kjaerbølling's *Skandinaviens Fugle*, edited by J. Collin (1875), though now much out of date, contains a good account of the ornithology of Denmark for the time. Some useful local faunas have been issued by Barfod, Christiansen, Faber, and Heiberg, and H. Winge gives a popular study of Danish bird life in *Danmarks Natur* (1899). English readers will find a chapter on bird life in Jutland in Chapman's *Wild Norway*, and articles by H. J. Elwes and A. C. Chapman in the *Ibis* for 1880 and 1894. A list of Danish birds was published by H. Winge in the *Ornithologisk Tidsskrift* for 1907, under the title *Fortegnelse over Danmark's Fugle*.

GERMANY.

By far the most important work is J. A. and J. F. Naumann's *Naturgeschichte der Vögel Deutschlands*, in 13 vols. (1822-53), with the *Fortsetzung der Nachträge* by J. H. Blasius, E. Baldamus, and F. Sturm. The new folio edition in 12 volumes, edited by Dr. C. R. Hennicke (1896-1904) includes the whole of 'Middle Europe' (see under W. Palearctic Region), and is most readily accessible to English readers.

A useful modern general work is Friderich's *Naturgeschichte der deutschen Vögel* (1889-91), but the fifth edition, edited and partly re-written by A. Bau (1905), is far the best, and takes a high place among national ornithological works. Dr. Reichenow has published a *Systematisches Verzeichnis der Vögel Deutschlands* (1898), with brief notes. Among the more important local and provincial works may be mentioned:

Borkum.—F. v. Droste Hülshoff, *Die Vogelwelt der Nordsee Insel Borkum* (1869). [Fair notes on habits.]

Heligoland.—H. Gaetke, *Die Vögelwarte Helgoland* (1891); also translated into English by R. Rosenstock under the title *Heligoland as an Ornithological Observatory* (1895).

(See also the recent 'Sonderheften' to the *Journ. f. Ornith.*, 1906-13, and *Die Fauna von Helgoland*, by K. W. v. Dalla Torre, 1889.)

Rhenish Provinces.—O. Le Roi, *Die Vogelfauna der Rheinprovinz* (1906). [An extremely accurate and thorough piece of work.] *Erster Nachtrag* (1912), 'Beiträge zur Ornithologie der Rheinprovinz.'

Brunswick.—R. Blasius, *Die Vögel der Herzogth. Braunschweig* (Ornis, 1896).

Brandenburg.—(See papers by H. Schalow and A. Bau in the *Journ. f. Ornith.* for 1876 and 1881.)

Mecklenburg.—H. D. F. Zander, *Naturgeschichte der Vögel Mecklenburgs* (1838-53). [Incomplete, and superseded as regards distribution by later works, but valuable for its observations on habits.]

C. Wüstnei and G. Clodius, *Die Vögel der Grossherzogthümer Mecklenburg* (1900).

Baden.—L. Fischer, *Katalog der Vögel Badens* (1897). [List only.]

Hesse and Hesse-Nassau (see papers by C. Deichler, O. Kleinschmidt, and W. Müller in the *Journ. für Orn.* for 1887, 1894, and 1896-7).

Saxony.—A. B. Meyer and F. Helm, *Verzeichniss der bis jetzt im Königr. Sachsen beobachteten Vögel* (1892).

Bavaria.—A. Jäckel, *Systematische Übersicht der Vögel Bayerns* (1891).

Silesia.—P. Kollibay, *Die Vögel der Preuss. Prov. Schlesien* (1906).

East Prussia.—See a paper by E. Hartert in the *Ibis*, 1892, 'On the Birds of East Prussia,' and a list of the birds of E. and W. Prussia in the *Mittheilungen des ornitholog. Vereins in Wien* (1887).

The recent reports on the Rossitten Observatory published in the *Journ. für Orn.* (1902-) should also be consulted.

Useful papers on the ornithology of Schleswig-Holstein and Pomerania have been also published

by J. Rohweder and E. F. von Homeyer, and many scattered faunal papers may be found in the pages of the *Journ. für Ornith.*, the *Ornith. Jahrbuch*, the *Ornith. Centralblatt*, and other periodicals.

HOLLAND.

H. Schlegel's *De Vogels van Nederland*, 2nd ed. (1878), though now out of date, is still an attractive work, and more useful than his earlier book on the same subject.

Useful lists have been published by H. Koller (1888), F. E. Blaauw (*Comparative List of the Birds of Holland and England*, 1893), H. Albarda (1897), and E. D. van Oort (*Notes from the Leyden Mus.*, 1908), but the best modern book on Dutch ornithology is Baron Snoukaert van Schauberg's *Aves Neerlandicæ*.

Among local faunas H. Albarda's *Naamlijst der in d. prov. Friesl. waargenomen Vogels* deserves mention.

BELGIUM.

1875. Baron Fallon, *Monographie des Oiseaux de la Belgique*.

1876-94. A. Dubois, *Faune illustrée des Vertébrés de la Belgique: II. Oiseaux*, 2 vols., text and atlas. [A good modern work on the birds of Belgium is much needed.]

See also A. de la Fontaine, *Faune du pays de Luxembourg* (1865-66).

FRANCE.

Although many useful local faunas have been published, there is no good general work on the ornithology of France. *Ornithologie Européenne, ou Catalogue descriptif . . . des Oiseaux observés en Europe* (2nd ed., 1867), by Degland and Gerbe, is quite out of date at the present time.

1896. L. Olphe-Galliard, *Faune ornithologique de l'Europe occidentale*, etc. (4 vols.).

1907. P. Paris, *Catalogue des Oiseaux observés en France*. [A useful list.]

A fairly complete list of local faunas up to 1878 is given by H. Saunders in the *Zoologist* for 1878, pp. 95-99. It is not necessary to reprint this lengthy list of titles, but a few of the more important are noted below.

H. Gadeau de Kerville, *Faune de la Normandie, Oiseaux*, 2 vols. (1891-92).

J. B. Bailly, *Ornithologie de la Savoie*, 4 vols. and atlas (1853-55). [Contains valuable observations on habits, and is generally reliable.]

J. B. Jaubert and Barthélemy-Lapommeraye, *Richesses ornithologiques du Midi de la France* (1859). [This large work contains surprisingly little information either on distribution or habits.]

A. Lacroix, *Catalogue raisonné des oiseaux observés dans les Pyrénées françaises* (1873-75). [Full of detail, but not altogether reliable.]

R. Martin, *Les Oiseaux de la Brenne* (1887); Lacordaire and L. Marchant, *Catalogue des Oiseaux . . . du Doubs et de la Haute-Saône* (1877), contain useful notes, but many local lists are little more than catalogues and by no means dependable. In English periodicals H. Saunders contributed two papers on the Pyrenees to the *Ibis* for 1884 and 1897. See also Backhouse (*Ibis*, 1887), Wallis (*t.c.* 1895), Eagle Clarke (*t.c.* 1889), and Evans (*t.c.* 1904). For the Rhone delta see W. Eagle Clarke, *Ibis*, 1895 and 1898; and for the Var Department see Gurney, *Ibis*, 1901.

CORSICA.

(For bibliography of the island see F. C. R. Jourdain, *Ibis*, 1911, p. 191, and 1912, p. 328.)

The most important English papers are those by Wharton (*Ibis*, 1876), Whitehead (*t.c.* 1885), and Backhouse (*Zool.*, 1891). The *Avifaune locale* of H. H. Giglioli, p. 632 (1890) should also be consulted.

1910-11. Dr. C. Parrot, *Ornith. Jahrbuch*, xxi.-xxii. *Beiträge zur Ornithologie der Insel Korsika*. [Interesting notes on the local forms.]

1911-12. F. C. R. Jourdain, *Ibis* 4 (papers), *Notes on the Ornithology of Corsica*. [Contains a résumé of what has been written on the ornithology of the island.]

SPAIN.

[There is no good general account of the ornithology of Spain. Arévalo's work is little more than a catalogue with names of localities. Irby's *Ornithology of the Straits of Gibraltar* is extremely useful, but only deals with a limited district, and the last edition has now been published eighteen years. The Spanish works are not to be depended on.]

1871. H. Saunders, *Ibis*, pp. 54, 205, 384, *An annotated list of the Birds of Southern Spain*. (The same writer also subsequently published a *Catologue des Oiseaux du Midi de l'Espagne* in the *Bulletin de la Société Zool. de France*, 1876-7.)

1875. L. H. Irby, *Ornithology of the Straits of Gibraltar* (1st ed.). [Superseded in 1895 by the 2nd edition, with coloured plates by Thorburn, which is by far the best work extant on the subject.]

1887. J. Arévalo y Baca, *Aves de España* (*Memorias de la Real Academia de Ciencias*, xi.).

(Much interesting matter with regard to the bird life of Andalusia and also of Spain generally will be found in Messrs. Chapman and Buck's *Wild Spain* (1893), and its successor, *Unexplored Spain* (1910), and the same remark applies to Colonel Verner's *My Life among the Wild Birds in Spain* (1909). There are also numerous papers in the *Ibis* by Lord Lilford, H. Saunders, Colonel Irby, A. Chapman (1884 and 1888), H. Noble (1902), H. Lynes (1912), etc.)

(No important paper has been published on the Balearic Isles since von Homeyer wrote in the *J. f. O.* for 1862.)

PORTUGAL.

[By far the most useful work on the ornithology of Portugal is Mr. W. C. Tait's List with notes in the *Ibis*, 1887, pp. 72, 182, 302, and 372. A similar work by the same author was also commenced in *Ann. Scienc. Naturelles Port.* for 1894, '*Aves de Portugal*.']

1896. P. d'Oliveira, *Aves da Penins. iberic. e especialm. de Portugal*. (Contains brief distributional notes.)

(Papers by A. C. Smith (*Ibis*, 1868 and 1870), and Dr. E. Rey (*J. f. O.*, 1872) also deal with this country.)

ITALY.

The following are the most important works on the general ornithology of Italy:—

1879-1906. E. H. Giglioli, *Iconografia dell' Avifauna Italiana*, Fasc. I.-LV. (folio).

1881. E. H. Giglioli, *Annali di Agricoltura*, No. 36, *Elenco delle specie di uccelli che trovansi in Italia*, etc.

1886. E. H. Giglioli, *Avifauna Italiana. Elenco delle specie di uccelli stazionarie o di passaggio*, etc.

1886. T. Salvadori, *Ann. Mus. Civ. Stor. Nat. Genova*, ser. 2, vol. iii. *Elenco degli Uccelli Italiani*.

1889-91. E. H. Giglioli, *Primo Resoconto dei risultati della Inchiesta Ornitologica in Italia*.

I. *Avifauna Italiana, elenco sistematico*, etc. (1889).

II. *Avifauna Locali* (1890).

III. *Notizie d'Indole generale Migrazioni, Nidificazione, Alimentazione ecc.* (1891).

1904. Arrigoni degli Oddi, *Manuale di Ornitologia italiana*. [A very useful little handbook.]

1906. G. Martorelli, *Gli Uccelli d'Italia*. [A more ambitious work, but with less practical information.]

1907. E. H. Giglioli, *Secondo Resoconto*, etc. *Nuovo elenco sistematico delle specie di uccelli*. [A good list and brought up to date, with lengthy lists of local names.]

1913. E. H. Giglioli, *Secondo Resoconto*, etc. *Elenco degli Uccelli Italiani. Riveduto al 31 Dic. 1912*. [This list gives some information on the question of local races, a subject ignored by most Italian writers.]

SARDINIA.

[Besides the general works mentioned above, A. B. Brooke's papers in the *Ibis*, 1873, should be consulted. Salvadori's *Catalogo degli Uccelli di Sardegna* (1864) is now quite out of date. See also G. Cara's *Osservaz. al Catalogo . . . del Salvadori* (1866) and G. Martorelli, *Osservazioni sui Mammif. ed Uccelli in Sardegna* (1884).]

SICILY.

[No modern work: Döderlein, *Avifauna del Modenese e della Sicilia* (1869-74) and *Rivista della Fauna Sicula* (1881): de Stefani, *Appunti e note di orn. siciliana* (1896), are the only general works available.]

MALTA, ETC.

[See a series of papers by C. A. Wright in the *Ibis*, 1864 to 1874.]

SWITZERLAND.

[The standard work on the ornithology of Switzerland is the *Faune Vertébrée de la Suisse*. II. *Oiseaux*, by V. Fatio, 2 vols. (1899-1904). This is a very sound and good piece of work and a credit to the country. A useful *Catalogue distributif des Oiseaux de la Suisse* (in three languages), by T. Studer and V. Fatio (1892), has brief annotations on distribution. The different groups of birds are treated in great detail in the *Catalogue des Oiseaux de la Suisse* (also published in German), by Fatio, Studer, and others, of which Livraisons I-IX. have been published (1889-1912). The distributional maps are a notable feature of this excellent series. Many English papers by Seebohm, Saunders, S. B. Wilson, O. V. Aplin, and others will be found scattered through the pages of the *Ibis* and *Zoologist*, but are too numerous to be mentioned in detail here.]

AUSTRO-HUNGARY.—General. A. v. Pelzeln, *Beitrag zur orn. Fauna d. oesterr.-ung. Monarchie* (K. k. zool. bot. Gesellsch. in Wien (1871, 1874, and 1876). Cf. also von Tschusi and von Homeyer's 'Verzeichniss' in *Ornis* ii. (1886).

AUSTRIA.—1877. Salzburg, *Die Vögel Salzburgs*, by von Tschusi zu Schmidhoffen.

1882. *Ornis Vindobonensis*, by Graf Marschall and A. v. Pelzeln. [Short notes on distribution.]

BOHEMIA.—(See A. Fritsch, *Journ. f. Orn.*, 1871-72 and 1876.)

HUNGARY.—1891. J. Frivaldszky, *Aves Hungariæ* (Int. Orn. Congress, Budapest). [Short Latin notes on each species.]

1899-1903. J. v. Madarász, *Magyarország Madarai* (contains an Appendix in German giving a brief résumé of the account of each species).

1899-1900. S. von Chernel, *Magyarország Madarai* (*Die Vögel Ungarns*), 2 vols.

[The *Ornithologische Fragmente* of Petenyi contains some useful notes on the life-histories of Hungarian birds. See also Kronprinz Rudolf in the *J. f. O.*, 1879 (the Danube valley). For Transylvania see Danford and Harvie-Brown in the *Ibis*, 1875; for Slavonia see W. Eagle Clarke, *Ibis*, 1884. Pražák's papers in the *J. f. O.* for 1897-98 on E. Galizia are unreliable and must be disregarded.]

CARINTHIA.—F. C. Keller, *Ornis Carinthiæ, Die Vögel Kärntens* (1890). [Contains valuable notes on the life-history of the birds recorded.]

DALMATIA.—See S. Brusina, *Orn. Jahrbuch*, 1891; P. Kolibay, *J. f. Orn.*, 1904, and *Orn. Jahrb.*, 1903. Cf. also *Aquila* x. (1903), Csörgey and Kolumbatovic.

HERZEGOVINA.—H. v. Kadich. *Im Zeichen der Schwalbe* II. (1887). *Hundert Tage im Hinterland*. [Field notes and list.]

BOSNIA.—A list of recorded species will be found in *Die Vögelsammlung des B.-H. Landesmuseums in Sarajëvo* (1891).

STYRIA.—E. Seidensacher, *Die Vögel der Steiermark* (Naumannia, 1858).

ROUMANIA.—1903. R. von Dombrowski, *Materialien zu einer ornis Rumäniens* (Bull. de la Soc. des Sciences de Bucarest XII.). [A briefly annotated List of Species.]

1912. R. v. Dombrowski, *Ornis Romanicæ*.

Many papers dealing with the Dobrogea have been published in the *Ibis*, *Aquila*, *J. f. O.*, etc. See especially W. H. Simpson (*Ibis*, 1860 and 1861), Alléon (*Ornis.*, II., 1886), Sintenis (*J. f. O.*, 1877), v. Almasy (*Aquila*, 1898), and D. Lintia (*Aquila*, 1909). O. Reiser also includes this district in the scope of his *Ornis Balcanica* (vol. ii.).

BULGARIA.

By far the most useful work is *Materialien zu einer Ornith. Balcanica*, vol. ii., *Bulgarien*, by O. Reiser (1894).

MONTENEGRO.

O. Reiser and L. v. Führer, *Materialien zu einer Ornith. Balcanica*, vol. iv. *Montenegro* (1896). [A very good piece of work.]

L. von Führer, *Ornith. Jahrbuch*, 1900-1901. *Beiträge zur Ornith. Montenegros*. [Good field notes supplementary to the preceding work.]

ALBANIA, MACEDONIA, TURKEY, ETC.

For Macedonia see P. J. M'Gregor, *Ibis*, 1906. [A good annotated list.] On Albania hardly anything has been written since Captain H. M. Drummond's list (*Annals and Mag. Nat. Hist.*, xii., 1843). See also under Greece. For Turkey see Alléon and Vian, *Rev. et Mag. de Zool.*, 1866-73.

SERVIA.

RUSSIA AND FINLAND.

Much of the Russian literature is in the Russian language and therefore useless to most of our readers, but Menzbier's work on the Ornithological Geography of European Russia (1882) deserves mention. Pleske's great work, *Ornithographia Rossica*, has never proceeded beyond the Sylviinae (1891). The first part of a Fauna of Russia (Aves), by V. L. Bianchi, has also been published (1911).

FINLAND.—1859. M. v. Wright, *Finlands Foglar*.

1860. A. v. Nordmann, *Übersicht der bis jetzt in Finn. u. Lappl. vorgekom. Vögelarten*.

See also J. A. Sandman, *Fogelfaunan på Karlö* (1892); S. A. Davies, *Ibis*, 1905.

For the Murman coast and Kola Peninsula, see H. J. Pearson, *Three Summers among the Birds in Russian Lapland* (1904), with interesting notes: *Übersicht d. Säugethiere u. Vögel d. Kola-Halbinsel*, II., by T. Pleske (1886), and also papers in the *Ibis*, 1900 (Witherby), 1896, 1899, 1902 (Pearson), etc.

For North-eastern Russia, Novaya Zemlya, etc., see *Ibis*, 1873 (Alston and Harvie-Brown), 1876 (Seebohm and Harvie-Brown); *Ibis*, 1882 (Seebohm), H. J. Pearson, 'Beyond Petsora Eastward' (1899), with useful local lists and field notes; 'Icebound on Kolguev,' by A. Trevor Battye (1895), etc.

For the Baltic Provinces see H. Goebel, *J. f. O.* (1873), V. Russow, *Die Orn. Ehst-, Liv- u. Cur-land's* (1880) and later papers by von Löwis and Baron Loudon.

There is nothing of note on Poland since the date of Taczanowski's *Oologia* except a paper by the same writer in *Ornis* 1888, but many local lists for Central and Southern Russia may be found in the *J. f. O.* from 1872 onwards by Fischer, Brandt, Pleske, Holtz, Goebel, etc. For Caucasia we have Radde's great work *Ornis caucasica* (1884), with four supplementary papers: and also Lorenz, *Beitrag zur Kenntniss des ornith. Fauna an der Nordseite des Kaukasus* (1887). Bogdanow's manual (1879) on the same subject is in Russ. (cf. *Ibis*, 1883).

GREECE.

The earlier works by Lindermayer (1843-60), von der Mühle (1844), Erhard (1858) and Krüper (*J. f. O.* 1859-64) are now superseded by O. Reiser's excellent work, *Materialien zu einer Orn. Balcanica*, III. Griechenland (1905). Krüper's observations in the *Griech. Jahreszeiten*, III., will, however, still be found useful, and the *Ibis* for 1860 contains papers by T. L. Powys (Lord Lilford) and W. H. Simpson.

CRETE.

(Nothing of importance has been published since Drummond Hay's paper (*Annals and Mag. of Nat. Hist.*, 1843), also in Spratt's *Travels and Researches in Crete* (1865), and subsequently translated into French in 1869.)

(b) *Africa*.

For those portions of Africa which fall within the Palæarctic region the following are some of the more important works, while for Africa generally Reichenow's *Die Vögel Afrikas* and Shelley's unfinished *Birds of Africa* may be consulted.

CANARIES.

The *Histoire Naturelle des Iles Canaries*, vol. ii., by P. B. Webb and S. Berthelot (1836-44), is long out of date, and the ornithology of the group must be studied in the papers by Capt. S. G. Reid (*Ibis*, 1887-8), H. B. Tristram (*Ibis*, 1889, 1890), Meade-Waldo (*Ibis*, 1889, 1890, 1893), A. Koenig (*J. f. O.*, 1890), E. Hartert (*Nov. Zool.*, 1901), R. v. Thanner (*Orn. Jahrb.*, 1905, 1908, etc.), J. Polatžek (*Orn. Jahrb.*, 1908), and Bannerman (*Ibis*, 1912).

MADEIRA.

The following papers should be consulted: A. Koenig (*J. f. O.*, 1890), W. R. O. Grant (*Ibis*, 1890 and 1896), and a long series of papers by Padre Schmitz, mostly published in the *Orn. Jahrbuch* (1893-1909).

AZORES.

See F. D. Godman, *Natural History of the Azores* (1870) and E. Hartert and W. R. O. Grant, *Nov. Zool.* (1905). This latter paper is the best up to date.

MAROCCO.

The *Ornithology of the Straits of Gibraltar*, by Col. L. H. Irby (2nd Edit., 1895) gives a fair account of the bird life of the country near Tangier. Since then papers have appeared in the *Ibis* by P. W. Munn (1897), J. I. S. Whitaker (1898) and E. G. Meade-Waldo (1903 and 1905). See also E. Hartert (*Nov. Zool.* ix. and x.).

ALGERIA.

The literature of Algeria is extensive (see H. Schalow, *J. f. O.* 1906, and J. H. Gurney, *Ibis*, 1871). Besides the great work of Loche (*Expl. scient. de l'Algérie, Oiseaux*, 1867) and papers by Tristram (*Ibis*, 1859-60), Salvin (*Ibis*, 1859), Taczanowski (*J. f. O.*, 1870), J. H. Gurney (*Ibis*, 1871), Dixon (*Ibis*, 1882), Koenig (*J. f. O.*, 1895 and 1896), Witherby (*Ibis*, 1905), and important papers by Rothschild and Hartert in *Nov. Zool.* (1912 and 1913) there is a list of species by W. R. O. Grant in Pease's *Travel and Sport in Africa* (1902).

TUNISIA.

The Birds of Tunisia by J. I. S. Whitaker (1905) is the standard work on the country. Besides Mr. Whitaker's earlier papers in the *Ibis*, important papers have been contributed to the *J. f. O.* by Koenig (1888 and 1892), von Erlanger (1898 and 1899) and Graf Zedlitz (1909).

EGYPT.

Both the *Ornithologie Nord-ost Afrikas* by T. v. Heuglin (1869-74) and the *Handbook to the Birds of Egypt* by G. E. Shelley (1872) are now much out of date. There is no good general work on modern lines, but important papers have been contributed to the *J. f. O.* by Dr. Koenig (1907) and by Messrs. W. S. Loat and M. J. Nicoll to the *Ibis* (1906 to the present time).

(c) Asia.

PALESTINE.

The Fauna and Flora of Palestine by H. B. Tristram (*Survey of W. Palestine*, 1884) is the only general work. See papers subsequently published in the *Ibis*, 1903 (S. Merrill), 1906 (Selater), 1910 (Carruthers) and some recent observations by Padre Schmitz (*Orn. Jahrb.* 1910 —, etc.). For Northern Syria and W. Mesopotamia, see Weigold (*J. f. O.*, 1912-13). For Sinai Peninsula, see Zedlitz (*J. f. O.*, 1912).

ASIA MINOR.

Since Danford's excellent papers in the *Ibis* (1877, 1878, and 1880), notes have appeared in the *Ibis* for 1891 (Dresser), 1900 (Selous), and also in the *J. f. O.* for 1908 (Braun).

CYPRUS.

Since Lord Lilford's *List of the Birds of Cyprus* in the *Ibis* for 1889, von Madarász has published a paper, *Über die Vögel Cyperns*, in the *Annal. Mus. Nat. Hung.* (1904), and the latest general account is that of Mr. J. A. S. Bucknill in the *Ibis*, 1909 and 1910, with addenda in 1911 and 1913.

Among the countries of the EASTERN PALEARCTIC REGION in Western Asia the most useful works for Persia are Blanford's *Zoology of Eastern Persia* (1876), Sarudny's *List of Persian Birds* (*J. f. O.*, 1911), and scattered papers by Sharpe, Sarudny, Witherby, Zugmayer, etc. For Transcaspia see Radde and Walter (*Ornis*, 1889); for literature of Central Asia see Schalow (*J. f. O.*, 1901), and for West Siberia since Seebohm's day useful local lists have been published by Popham (*Ibis*, 1897, 1898, and 1901). For the Lena see Hartert and Hall (*Ibis*, 1904), and for the Kolyma, Dresser and Buturlin (*Ibis*, 1906, *J. f. O.*, 1908), etc. For Japan, see Seebohm's *Birds of the Japanese Empire* (1896), and Ogawa's *Hand List of the Birds of Japan* (1908).

NEARCTIC REGION.—The following works should be noted :—

For GREENLAND.—Special mention must be made of A. L. V. Manniche's work on the *Terrestrial Mammals and Birds of North East Greenland* (1910), which contains invaluable field notes on the habits and displays of Arctic birds. The Lists of Reinhardt (cf. *Ibis*, 1861), Hagerup (1891), Schalow (*J. f. O.*, 1895), Winge, *Grönlands Fugle* (1899), and Helms (*J. f. O.*, 1902, and *Ber. über V. Int. Orn. Kongress*, 1911), should also be consulted. (See also H. Schalow, *Die Vögel der Arktis*, mentioned above.)

LABRADOR.—See B. Hantzsch, *J. f. O.*, 1898. Cf. also L. M. Turner, *List of the Birds of Labrador* (1885).

ONTARIO.—T. M'Ilwraith, *The Birds of Ontario* (1886), 2nd Edit. (1894).

MONTREAL.—E. Wintle, *The Birds of Montreal* (1896).

MANITOBA.—E. Seton Thompson, *The Birds of Manitoba* (1891).

BRITISH COLUMBIA.—J. Fannin, *A Preliminary Catalogue of the Birds of British Columbia* (1898).

ALASKA.—E. W. Nelson, *Report upon Nat. History Collections in Alaska between 1877-81*.

L. M. Turner, *Contributions to the Nat. History of Alaska* (1886).

Local works on the Ornithology of the United States are too numerous to be recorded here in detail. Many of the States have now their local ornithologies, and numerous local lists will be found in the pages of the *Auk* (1884-). The more important faunal works are those on the States of New York (De Kay and Eaton), Maine (Knight), Pennsylvania and N.J. (Stone), Maryland (Coues and Prentiss), Michigan (Cook), Indiana (Butler), Illinois and Wisconsin (Cory), Minnesota (Hatch), Missouri (Coues), Kansas (Goss), Washington (Dawson), Colorado (Selater), California (Cooper), etc.

(d) *British.*

NORTHUMBERLAND.—J. Hancock, *A Catalogue of the Birds of Northumberland and Durham*, Nat. Hist. Trans. of Northumberland and Durham, VI. [1874]. A good annotated list of great historical interest.

See also A. Chapman, *Bird Life of the Borders*, 1st Edit. [1889]; 2nd Edit. [1907]. Contains useful field notes.

G. Bolam, *The Birds of Northumberland and the Eastern Borders* [1912]. A very thorough piece of work.

DURHAM.—[See under Northumberland, Hancock, etc.].

H. B. Tristram, *Victoria History of the County of Durham*. I., Birds (pp. 175-191) [1905]. List of 247 species.

CUMBERLAND.—H. A. Macpherson and T. Duckworth, *The Birds of Cumberland . . . including the Birds of Westmorland* [1886].

H. A. Macpherson, *A Vertebrate Fauna of Lakeland*. Birds, pp. 87-460 [1892].

Victoria History of the County of Cumberland, vol. i. Birds, pp. 179-217 [1901].

All three works are good, but cover much the same ground. The *Victoria History* List treats of 259 species.

WESTMORLAND.—[See under Cumberland, Macpherson and Duckworth and Macpherson above].

YORKSHIRE.—W. Eagle Clarke and W. D. Roebuck, *A Handbook of the Vertebrate Fauna of Yorkshire*. Birds, pp. 15-90 (W. E. C.) [1881]. A briefly annotated list.

O. Grabham, *Victoria History of the County of York*. I. Birds, pp. 323-350 [1907].

T. H. Nelson, W. E. Clarke, and F. Boyes, *The Birds of Yorkshire*. 2 vols [1907]. The best work on the subject; 325 species recorded.

[See also under Lincolnshire, J. Cordeaux].

LANCASHIRE.—F. S. Mitchell, *The Birds of Lancashire*, 1st Edit. [1885]; 2nd Edit., revised by H. Saunders [1892].

H. O. Forbes, *Victoria History of the County of Lancaster*. I. Birds, pp. 189-205 [1906]. Annotated list of 269 species.

CHESHIRE.—T. A. Coward and C. Oldham, *The Birds of Cheshire* [1900].

T. A. Coward and C. Oldham, *A Vertebrate Fauna of Cheshire and Liverpool Bay*. 2 vols. Birds, vol. i. pp. 91-459 [1910]. Both good; the latter fuller, and brought up to date; 231 species.

DERBYSHIRE.—F. B. Whitlock, *The Birds of Derbyshire* [1893]. Fair; somewhat hurriedly written.

F. C. R. Jourdain, *Victoria History of the County of Derby*. Vol. i., Birds (pp. 119-149) [1905].

Annotated list; 235 species recorded.

NOTTINGHAMSHIRE.—W. J. Sterland and J. Whitaker, *A Descriptive List of the Birds of Nottinghamshire* [1879].

J. Whitaker, *Victoria History of the County of Nottingham*. Vol. i., Birds (pp. 156-176) [1906]. Notes rather brief.

J. Whitaker, *Notes on the Birds of Nottinghamshire* [1907]. Popularly written notes on 259 species.

LINCOLNSHIRE.—J. Cordeaux, *Birds of the Humber District* (N. Lincs. and E. Yorks.) [1872].

J. Cordeaux, *A List of British Birds belonging to the Humber District* [1899]. Annotated list. No separate ornithological fauna of Lincoln has been issued as yet.

SHROPSHIRE.—W. E. Beckwith, *The Birds of Shropshire*. Trans. Shropshire Archæol. and Nat. Hist. Soc., II. [1879].

H. E. Forrest, *A Fauna of Shropshire*. Birds, pp. 100-179 [1899]. A popular little handbook.

Victoria History of Shropshire. Vol. i., Birds, pp. 159-186 [1908]. A good annotated list of 246 species.

STAFFORD.—A. McAlldowie, *The Birds of Staffordshire* (Rep. and Trans. North Stafford Field Club [1893] Now quite out of date and superseded by the following:

J. R. B. Masefield, *Victoria History of the County of Stafford*. Vol. i., Birds (pp. 139-161) [1908]. Good list, with notes on 222 species.

LEICESTERSHIRE.—M. Browne. *The Vertebrate Animals of Leicestershire and Rutland* [1889]. (See also the *Zoologist*, 1885-6-7.)

M. Browne, *Victoria History of the County of Leicester*. Vol. i., Birds, pp. 114-157 [1907]. A very good and fully annotated list of 213 species.

RUTLAND.—[See under Leicester, M. Browne].

C. R. Haines, *Notes on the Birds of Rutland* [1908].

Victoria History of the County of Rutland. Vol. i., Birds, pp. 55-76 [1908]. Fairly good annotated list of 202 species.

HEREFORD.—E. Cambridge Phillips, *Victoria History of the County of Hereford*. Vol. i., Birds, pp. 130-148 [1908]. Annotated list of 211 species.

WORCESTERSHIRE.—R. F. Tomes, *Victoria History of the County of Worcester*. Vol. i., Birds, pp. 139-170 [1901]. Good list, with full notes on 207 species.

WARWICKSHIRE.—R. F. Tomes, *Victoria History of the County of Warwick*. Vol. i., Birds, pp. 189-207 [1904]. Also fully annotated list of 205 species.

NORTHAMPTONSHIRE.—Lord Lilford, *Notes on the Birds of Northamptonshire*, etc. 2 vols. [1895].

H. H. Slater, *Victoria History of the County of Northampton*. Vol. i., Birds, pp. 111-128 [1902]. Annotated list of 213 species.

HUNTINGDONSHIRE.—[No county list].

CAMBRIDGESHIRE.—A. H. Evans, *Handbook to the Nat. Hist. of Cambridgeshire*. (Birds, pp. 75-99) [1904]. A very brief list with notes on a few of the more interesting species only.

NORFOLK.—H. Stevenson and T. Southwell, *The Birds of Norfolk*. 3 vols. [1866-70-90]. A very interesting work.

- J. H. Gurney, *A Catalogue of the Birds of Norfolk*. (Reprinted from Mason's *History of Norfolk*) [1884].
- T. Southwell, *Victoria History of the County of Norfolk*. Vol. i., Birds, pp. 220-245 [1901]. List with very brief notes on 308 species.
- SUFFOLK.—C. Babington, *Catalogue of the Birds of Suffolk*. (*Proc. Suff. Instit. of Arch. and Nat. Hist.*) [1884-86].
- J. G. Tuck, *Victoria History of the County of Suffolk*. Vol. i., Birds (pp. 177-214) [1911]. Good list of 283 species.
- ESSEX.—M. Christy, *The Birds of Essex*. (*Essex Field Club Special Memoirs*, II.) [1890].
- M. Christy, *Victoria History of the County of Essex*. Vol. i., Birds, pp. 232-253 [1908]. Good annotated list of 287 species.
- HERTFORDSHIRE.—A. F. Crossman, *Victoria History of the County of Hertford*. Vol. i., Birds, pp. 193-216 [1902]. Useful annotated list of 210 species.
- BEDFORDSHIRE.—J. Steele Elliott, *The Vertebrate Fauna of Bedfordshire*. Birds [1897-1901].
- J. Steele Elliott, *Victoria History of the County of Bedford*. Vol. i., Birds, pp. 104-137 [1904]. Good annotated list of 214 species.
- BERKSHIRE.—A. W. M. Clark Kennedy, *The Birds of Berkshire and Buckinghamshire* [1868].
- H. Noble, *Victoria History of Berkshire*. Vol. i., Birds, pp. 140-166 [1906]. Very good annotated list of 218 species.
- MIDDLESEX.—J. E. Harting, *The Birds of Middlesex* [1866]. An inferior work, and now quite out of date; 225 species.
- OXFORDSHIRE.—O. V. Aplin, *The Birds of Oxfordshire* [1889]. Good, but numerous reports by the same writer have since appeared in the *Zoologist*; 242 species recorded.
- GLOUCESTERSHIRE.—C. A. Mitchell and W. B. Strugnell, *The Fauna and Flora of Gloucestershire* [1892].
- W. L. Mellersh, *A Treatise on the Birds of Gloucestershire* [1902]. An essay on the fauna as affected by local conditions, and a reference list of 270 species.
- MONMOUTH.—[No county fauna exists].
- SOMERSET.—C. Smith, *The Birds of Somersetshire* [1869]. Much of this book is taken up with descriptions of plumage and general information, while meagre details are given with regard to the county.
- M. A. Mathew, *A Revised List of the Birds of Somerset*. (*Proc. Somerset Arch. and Nat. Hist. Soc.*, xxxix). A fair list, but somewhat lacking in detail.
- F. L. Blathwayt, *Victoria History of the County of Somerset*. Vol. i., Birds, pp. 140-162 [1906]. A great improvement on previous lists, but plenty of scope for further research; 258 species recorded.
- WILTSHIRE.—A. C. Smith, *The Birds of Wiltshire* [1887]. A bulky work, but contains little definite information with regard to the county; 235 species recorded.
- BUCKINGHAMSHIRE.—[See under Berkshire, A. W. M. Clark Kennedy].
- E. Hartert, *Victoria History of the County of Buckingham*. Vol. i., Birds, pp. 128-152 [1905]. Useful list of 208 species.
- SURREY.—J. A. Bucknill, *The Birds of Surrey* [1900]. Supplementary papers by the same writer in the *Zoologist*.
- J. A. Bucknill, *Victoria History of the County of Surrey*. Vol. i., Birds, pp. 202-218 [1902]. Rather briefly annotated list of 256 species.
- KENT.—R. J. Balston, C. Shepherd, and E. Bartlett, *Notes on the Birds of Kent* [1907].
- B. Alexander, *Victoria History of the County of Kent*. Vol. i., Birds, pp. 267-301 [1908]. Annotated list, with many original notes.
- N. F. Ticehurst, *A History of the Birds of Kent* [1909]. Far the best work on the subject, and admirable in many ways; 312 species recorded.

SUSSEX.—W. Borrer, *The Birds of Sussex* [1891]. Good for the period when it was written, but now out of date.

J. G. Millais, *Victoria History of the County of Sussex*. Vol. i., Birds, pp. 273-298 [1905]. Useful list of 302 species, but many since recorded.

HAMPSHIRE.—J. E. Kelsall, *A briefly Annotated List of the Birds of Hampshire, etc.* (Proc. Hants Field Club) [1890].

E. G. B. Meade Waldo, *Victoria History of Hampshire*. Vol. i., Birds, pp. 208-238 [1900]. A somewhat brief and imperfect annotated list.

J. E. Kelsall and P. W. Munn, *The Birds of Hampshire and the Isle of Wight* [1905]. A useful work; 295 species recorded.

DORSETSHIRE.—J. C. Mansell-Pleydell, *The Birds of Dorsetshire* [1888]. The only list extant; 267 species.

DEVONSHIRE.—W. E. H. Pidsley, *The Birds of Devonshire* [1891]. Much inferior to the following work.

M. A. Mathew and W. S. D'Urban, *The Birds of Devon* [1895]. A very good and accurate piece of work.

W. S. M. D'Urban, *Victoria History of the County of Devon*. Vol. i., Birds, pp. 291-334 [1906]. Good annotated list of 294 species.

CORNWALL.—E. H. Rodd, *The Birds of Cornwall and the Scilly Islands*. Edit. by J. E. Harting. [1880].

J. Clark, *Victoria History of the County of Cornwall*. Vol. i., Birds, pp. 309-347 [1906]. A very good annotated list on the whole; 303 species recorded.

ISLE OF MAN.—P. M. C. Kermode (*List of Birds*, Trans. I. of Man Nat. Hist and Antiquarian Soc. Vol. i. [1879-1884], and Vol. iii. [1901]).

P. G. Ralfe, *The Birds of the Isle of Man* [1905]. Records 183 species.

WALES

NORTH WALES.—W. H. Dobie, *The Birds of West Cheshire, Denbigh and Flint*. (Proc. Chester Soc. Nat. Sci. and Lit., No. iv.) [1894].

H. E. Forrest, *The Vertebrate Fauna of North Wales*. Birds, pp. 67-417 [1907]. An extremely useful work.

(See also numerous papers by Messrs. Aplin, Coward and Oldham, H. E. Forrest and F. C. Rawlings in the *Zoologist*, 1894 and 1900-1910).

SOUTH WALES.—E. Cambridge Phillips, *The Birds of Breconshire*, 1st Edit. (reprinted from the *Zoologist*, 1881-1882) [1882]; 2nd Edit. [1899].

M. A. Mathew, *The Birds of Pembrokeshire and its Islands* [1894]. Good; 229 species recorded.

[A Committee], *The Birds of Glamorgan*. (Rep. and Trans. Cardiff Nat. Soc., xxxi., 1898-9) [1900]. Fair list.

(See also J. H. Salter's *List of Birds of Aberystwyth* [1900], and papers in *Zoologist*, by Messrs. Aplin, Nicholl, Raeburn, Salter, etc.)

SCOTLAND

The faunal series by Messrs. Harvie-Brown, Buckley, and Evans is admirably compiled and thoroughly reliable.

R. Gray, *The Birds of the West of Scotland, including the Outer Hebrides* [1871].

SOLWAY.—R. Gray and T. Anderson, *The Birds of Ayrshire and Wigtownshire* (Reprinted from Proc. Nat. Hist. Soc. of Glasgow) [1869].

H. S. Gladstone, *The Birds of Dumfriesshire* [1910]; Addenda and Corrigenda [1911]. A very full and good account.

H. S. Gladstone, *A Catalogue of the Vertebrate Fauna of Dumfriesshire*. Birds, pp. 11-53 [1912]. Little more than a list.

- TWEED.—G. Muirhead, *The Birds of Berwickshire*. 2 vols. [1889-1895]. Contains much folk-lore.
 A. H. Evans, *A Fauna of the Tweed Area* [1911].
 [See also under Northumberland, G. Bolam and A. Chapman.]
- FORTH.—[Not yet published].
- CLYDE.—[Not yet published].
- TAY.—J. A. Harvie-Brown, *A Fauna of the Tay Basin and Strathmore* [1906].
- ARGYLL.—J. A. Harvie-Brown and T. E. Buckley, *A Vertebrate Fauna of Argyll and the Inner Hebrides* [1892].
- DEE.—W. MacGillivray, *The Natural History of Deeside and Braemar* [1855].
 G. Sim, *The Vertebrate Fauna of 'Dee'* [1903].
- MORAY.—J. A. Harvie-Brown and T. E. Buckley, *A Fauna of the Moray Basin*. 2 vols. [1895].
- SKYE and W. ROSS.—J. A. Harvie-Brown and H. A. Macpherson, *A Fauna of the North-west Highlands and Skye* [1904].
- SUTHERLAND.—J. A. Harvie-Brown and T. E. Buckley, *A Vertebrate Fauna of Sutherland, Caithness, and West Cromarty* [1887].
- OUTER HEBRIDES.—J. A. Harvie-Brown and T. E. Buckley, *A Vertebrate Fauna of the Outer Hebrides* [1888.] (Addenda in *Ann. of Scot. Nat. Hist.*, 1902-3). Cf. also C. V. A. Peel, *Wild Sport in the Outer Hebrides* (pp. 110-127) [1901].
- ORKNEYS.—T. E. Buckley and J. A. Harvie-Brown, *A Vertebrate Fauna of the Orkney Islands* [1891].
- SHETLANDS.—H. L. Saxby, *The Birds of Shetland* [1874]. Practically confined to Unst: excellent field notes.
 A. H. Evans and T. E. Buckley, *A Vertebrate Fauna of the Shetland Islands* [1899].
 (See also numerous faunal papers in the *Annals of Scottish Nat. History* and *Scottish Naturalist*, the *Proceedings of the Nat. Hist. Soc. of Glasgow*, etc., W. Eagle Clarke's *Studies in Bird Migration*, 2 vols. [1912], and J. Wigglesworth's *St. Kilda and its Birds* [1903] will also be found useful.)

IRELAND

- GENERAL.—W. Thompson, *The Natural History of Ireland, Birds*. 3 vols. [1849-51]. Exceedingly good for the period, but now superseded by later work.
 A. G. More, *A List of Irish Birds*. 1st Edit. [1885]. 2nd Edit. [1890].
 R. J. Ussher and R. Warren, *The Birds of Ireland* [1900]. A most admirable work in every way.
 R. J. Ussher, *A List of Irish Birds* [1908]. Only brief annotations.
 (See also R. M. Barrington, *The Migration of Birds* [1900] and numerous faunal papers in the *Zoologist* and *Irish Naturalist*.)
 N.B. The above list is not intended to be exhaustive, but merely represents those works which will be found most useful to students and which have been consulted in the preparation of the present work. [F. C. R. J.]

VII. MIGRATION.

1874. J. A. Palmén, *Om foglarnes flyttningsvägar*.
 1876. J. A. Palmén, *Ueber die Zugstrassen der Vögel*.
 1880-89. J. A. Harvie-Brown, J. Cordeaux, and others, *Reports on the Migration of Birds in the Spring and Autumn, 1879-87* (1880-89).
 1881. E. F. von Homeyer, *Die Wanderungen der Vögel*.
 1886. M. Menzbier, *Die Zugstrassen der Vögel im europäischen Russland* (*Bull. de la Soc. des Nat. de Moscou*).
 1891. H. Gätke, *Die Vogelwarte Helgoland*. Edit. by R. Blasius.
 1892. C. Dixon, *The Migration of Birds*, etc.
 1892. J. Cordeaux, *On the Migration of Birds*, etc. (*Compte rendu II. Int. Orn. Congress, Buda-Pest*).

1895. H. Gätke, *Heligoland as an Ornithological Observatory*. Transl. by R. Rosenstock.
 1895. O. Herman, *Die Elemente des Vogelzuges in Ungarn bis 1891*.
 1895. C. Dixon, *The Migration of British Birds*, etc.
 1897. F. B. Whitlock, *The Migration of Birds, a consideration of Herr Gätke's views*.
 1900. R. M. Barrington, *The Migration of Birds as observed at Irish Lighthouses and Lightships*.
 1902. J. Thienemann (J. f. O.), *Jahresberichte der Vogelwarte Rossitten*. [In progress.]
 1905. O. Herman, *Recensio Critica automatica of the Doctrine of Bird Migration*.
 1906. *Bulletin of the Brit. Ornith. Club*. Vol. xvii. Report on the immigrations of Summer Residents in the spring of 1905; also vols. xx., xxii., xxiv., xxvi., xxviii., and xxx. [In progress.]
 1906. H. Gaetke, *Die Ornith. Tagebücher, 1847-87, von H. Gaetke*. Edit. by R. Blasius (J. f. O.).
 1910. H. Weigold (J. f. O.), *Jahresbericht über den Vogelzug auf Helgoland*. [In progress.]
 1912. W. Eagle Clarke, *Studies in Bird Migration*. 2 vols.
 1912. T. A. Coward, *The Migration of Birds*. Cambridge Manuals of Science. A good small general work.

See also papers on this subject published in the *Ibis*, *Aquila*, *J. f. O.*, etc., as well as Professor Newton's important article on Migration in the *Dictionary of Birds*, Part II. (1893). A Bibliography of earlier works on this subject will be found in Palmén's work *Om Foglarnes flyttningvägar* (1874), referred to above. [F. C. R. J.]

VIII. OOOLOGY.

- 1825-38. F. A. L. Thienemann, *Systematische Darstellung der Fortpflanzung der Vögel Europas mit Abbildung. der Eier*; im Vereine mit L. Brehm und G. A. W. Thienemann (V. Abth.). [The first work of importance with good coloured plates.]
 1831-36. W. C. Hewitson, *British Oology*, 2 vols. [First edition, with 155 col. pl., beautifully coloured by hand.]
 1842. W. C. Hewitson, *Supplement to British Oology* [14 col. pl.].
 1845-56. F. A. L. Thienemann, *Fortpflanzungsgeschichte der gesammten Vögel*, etc. [150 col. pl.]
 1846. W. C. Hewitson, *Coloured Illustrations of the Eggs of British Birds*, etc. [2nd Edit. 2 vols.]
 1855-63. F. W. J. Baedeker, *Die Eier der europäischen Vögel nach der Natur gemalt*, von F. W. J. B. [Text and Atlas of well-executed plates (folio)].
 1856. W. C. Hewitson, *Coloured Illustrations of the Eggs of British Birds* [3rd Edit. 2 vols.]
 1856-61. F. O. Morris, *A Natural History of the Nests and Eggs of British Birds*, 3 vols. [Inferior coloured plates. Three other editions are practically alike.]
 1864. A. Newton, *Ootheca Wolleyana*, Part I. (Acciptres). [9 col. pl. of eggs and 9 of nests, etc.]. Many interesting notes.
 1883-85. H. Seebohm, *A History of British Birds, with coloured illustrations of their Eggs*. [6 parts, with 68 col. pl., roughly executed.]
 1893. C. Dixon, *The Nests and Eggs of British Birds*. [A useful compilation. Only the large paper edit. contains 12 plates.]
 1894. C. Dixon, *The Nests and Eggs of non-indigenous British Birds*.
 1895. R. Kearton, *British Birds' Nests*. [Nearly 130 illustrations from Photographs of eggs and nests *in situ*.]
 1895-96. F. Poynting, *The Eggs of British Birds. Limicolæ*. [54 beautifully executed coloured plates.]
 1896. H. Seebohm, *Coloured Figures of the Eggs of British Birds*. [59 good coloured plates. Letterpress selected by R. B. Sharpe from Seebohm's works.]
 1896. F. O. Morris, *A Natural History of the Nests and Eggs of British Birds*. [Fourth Edit.; re-written by W. B. Tegetmeier; plates inferior; letterpress improved, but still of little value.]
 1896-98. F. W. Frohawk (illustrator), *British Birds with their Nests and Eggs*. [Letterpress by Butler and others. 24 col. plates of eggs. These were afterwards reprinted separately with letterpress by Butler.]

1896-1904. C. R. Henniecke [Editor]. Naumann's *Naturgeschichte der Vögel Mittel-Europas*. 12 vols., folio, with coloured plates of eggs by A. Reichert.

1897-99. O. A. J. Lee, *Among British Birds in their Nesting Haunts*. 4 vols., folio, with plates of nests.

1899. A. Nehr Korn, *Katalog der Eiersammlung*. [1st Edit., with 4 col. pl. Also a 2nd Edit. published in 1910.]

1900. R. Kearton, *Our Rarer British Breeding Birds*. [70 illustrations of nests from photographs.]

1900-5. E. Rey, *Die Eier der Vögel Mitteleuropas*. 128 coloured plates. [The first work in which accurate dimensions and weights of series of eggs are given.]

1901-12. E. W. Oates, S. G. Reid, etc., *Catalogue of the Collection of Birds Eggs in the British Museum*, 5 vols., with 79 excellent coloured plates by H. Grönvold. [The catalogue is planned on a defective system. In most cases no clue is given to the number of eggs in the clutch, and the measurements given are useless.]

1902. A. Newton, *Ootheca Wolleyana*, Part II. (Picariæ-Passeræ). [Four col. pl. of eggs, poorly executed, and 4 views.]

1905. H. E. Dresser, *Eggs of the Birds of Europe*. [106 plates by the three-colour process, mostly rather disappointing. Several species are here figured for the first time.]

1905. A. Newton, *Ootheca Wolleyana*, Part III. (Columbæ-Alcæ). [8 beautifully executed plates of great-auks' eggs.]

1906. G. Krause, *Oologia Universalis Palearctica*. [In progress. A splendid atlas of plates. Many are in advance of any that have been used up to the present. The letterpress is a negligible quantity.]

1906. F. C. R. Jourdain, *The Eggs of European Birds*. [In progress. The eggs of sub-specific forms are here treated separately for the first time.]

1907. A. Newton, *Ootheca Wooleyana*, Part IV. Alcæ-Anseres. [Map and three plates; also supplement.] [F. C. R. J.]

IX. PERIODICAL.

(a) *British.*

1843- . *The Zoologist*. 1st series, edit. by E. Newman (1843-65). 2nd series, ed. by E. Newman (1866-1876). 3rd series, edit. by J. E. Harting (1877-1896). 4th series, edit. by W. L. Distant (1897-). [In progress.]

1851-58. *The Naturalist*. Conducted by B. R. Morris, F. O. Morris, and C. R. Bree.

1852- . *The Field, the Farm, the Garden; the Country Gentleman's Newspaper*. ('Naturalist' department). [In progress.]

1859- . *The Ibis*. 1st series, ed. by P. L. Selater (1859-64). 2nd series, ed. by A. Newton (1865-70). 3rd series, ed. by O. Salvin (1871-76). 4th series, ed. by Salvin and Selater (1877-82). 5th series, ed. by Selater and Saunders (1883-88). 6th series, ed. by Selater (1889-94). 7th series, ed. by Selater and Saunders (1895-1900). 8th and 9th series, ed. by Selater and Evans (1901-1912). 10th series, ed. by W. L. Selater (1913-). [In progress.]

1865- . *The Naturalist*. 1st series (1865-67). 2nd series (1875-). [In progress.]

1871-91. *The Scottish Naturalist*. 1st series (1871-82). 2nd series (1883-91).

1876-78. *The Ornithological Miscellany*. (3 vols.) Edited by G. D. Rowley.

1891-1911. *Annals of Scottish Natural History*.

1892- . *The Irish Naturalist*. Edit. by G. H. Carpenter and R. L. Praeger. [In progress.]

1892- . *Bulletin of the British Ornithologists' Club*. [In progress.]

1894- . *The Avicultural Magazine*. [In progress.]

1896-97. *The Ornithologist*. Edited by H. K. Swann. (1 vol., all published.)

1897- . *Country Life*. (Contains occasional articles on ornithological subjects illustrated by photographs.) [In progress.]

- 1907- . *British Birds*. Edited by H. F. Witherby, W. P. Pycraft, F. C. R. Jourdain, and N. F. Ticehurst. [In progress.]
 1912- . *The Scottish Naturalist*. Edit. by Eagle Clarke, Evans, etc. [In progress.]
 (Occasional papers bearing on British Ornithology may be found in the *Proceedings of the Zoological Society of London* (1830-); also in *Novitates Zoologicae* (1894-), and the Reports and Transactions of numerous Field Clubs and Natural History Societies.)

(b) *Foreign.*

- 1853- . *Journal für Ornithologie*. Edit. by J. Cabanis (1853-93); edit. by A. Reichenow (1894.)
 1876- . *Bulletin de la Soc. Zool. de France*.
 1876-82. *Ornithologisches Centralblatt*. Edit. by J. Cabanis and A. Reichenow.
 1876-83. *Bulletin of the Nuttall Ornith. Club*. Edit. by J. A. Allen.
 1884-88. *Zeitschrift f. d. ges. Ornithologie*. Edit. by J. v. Madarasz.
 1884- . *The Auk*. Edit. by J. A. Allen (successor to the *Bull. Nutt. Orn. Club*).
 1885- . *Ornis*. Edit. by R. Blasius v. Hayek (1885-96); *n. s.* (1898-).
 1890- . *Ornithologische Monatsschrift* (formerly *Deutsche Verein zum Schutze der Vogelwelt, Monats-schrift*).
 1890- . *Ornithologische Jahrbuch*. Edited by V. Tschusi zu Schmidhoffen.
 1891- . *Zeitschrift für Oologie und Ornithologie*. Ed. by H. Hocke (1891-1910).
 1893- . *Ornithologische Monatsberichte*. Edit. by A. Reichenow.
 1894- . *Aquila*. Edit. by O. Herman. [Hungarian: printed in Magyar and German.]
 1897- . *Avicula*. [Italian.]
 1898- . *Die Schwalbe*. [Austrian.]
 1899- . *Cooper Ornithological Club Bulletin* (1899). *The Condor* (1900-).
 1905- . *Berajah and Falco*. Irregular serials by O. Kleinschmidt.
 1907- . *Dansk Ornithologisk Forenings Tidsskrift*. [Danish.]
 1909- . *Messenger Ornithologique*. [Russian, but printed in French.]
 1910- . *Revue Française d'Ornithologie*. Edit. by L. Denise and A. Ménégaux.
 1912- . *Ardea, Tijdschrift d. Nederlandsche Orn. Vereeniging*. [Dutch.] [F. C. R. J.]

INDEX

N.B.—The detail references of species having a double name will be found under the more general of the two terms, e.g. *Arctic-tern* will be under *Tern*, *Arctic*.

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| 2. Great crested-grebe | 5. Redthroated-diver |
| 3. Little-grebe | 6. Blackthroated-diver |

By H. Grönvold



THE BRITISH BIRD BOOK

THE
BRITISH BIRD
BOOK

AN ACCOUNT OF ALL THE BIRDS, NESTS
AND EGGS FOUND IN THE BRITISH ISLES

EDITED BY
F·B·KIRKMAN·B·A·OXON

ILLUSTRATED BY TWO HUNDRED COLOURED
DRAWINGS AND NUMEROUS PHOTOGRAPHS

VOLUME IV

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